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Illinois Environmental Protection Agency

Performance Standards Verification Plan
Source Area 4 Remedial Design
Southeast Rockford Groundwater Contamination Site

September 13, 2004

Draft Final Report

Illinois Environmental Protection Agency

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Contents

Contents

1 Section One

Section 1
Introduction

The Performance Standards Verification Plan (PSVP) describes procedures to ensure that all performance standards are met according to remedial design specifications. This Draft Final PSVP will be submitted as part of the "Pre-Final" design package to the Illinois Environmental Protection Agency (Illinois EPA), as specified in the Southeast Rockford Groundwater Contamination Superfund Site, Source Area 4, Remedial Design Work Plan, prepared by Camp Dresser & McKee (CDM).

The Draft Final PSVP has been developed following incorporation of Illinois EPA and USEPA comments on the "Intermediate" design. The Final PSVP will be submitted with the Pre-Final Design and the Final Design reports for submittal, prior to the start of construction by the Remedial Action Contractor, herein after referred to as Contractor, selected and contracted by the Illinois EPA. The PSVP provides a mechanism to ensure that short-term and long-term performance standards are met.

Components of the PSVP include: 1) Remedial Design Quality Assurance Project Plan, 2) Remedial Design Sampling and Analysis Plan, and 3) Remedial Design Health and Safety Plan.

Quality assurance (QA) is the planned or systematic actions that are implemented to ensure that construction work is completed in accordance with design requirements and applicable standards for materials, equipment, and workmanship. Quality assurance includes: 1) establishment of a construction quality control (QC) program and 2) implementation and ongoing evaluation of the program by performing inspections, verifications, and audits, using established means to control and measure the quality of products and workmanship. Quality control also includes the implementation of corrective measures, when necessary to ensure proper completion of work.

The Record of Decision (ROD) for the Southeast Rockford Superfund site was signed by the Region V Administrator of the United States Environmental Protection Agency (U.S. EPA), on June 11, 2002. Under contract to the Illinois EPA, the Remediation Contractor shall follow the ROD, the approved Statement of Work (SOW), and the approved Remedial Design (RD) for remedial action at Area 4 for the site.

1.1 Project Description

In 1981, the City of Rockford discovered groundwater contamination at the property that became the Southeast Rockford Superfund site. In 1981 to 1997, the Illinois EPA and the Illinois Department of Public Health (IDPH) performed investigations at the site that revealed that volatile organic compound (VOC) contaminants were present in the groundwater, soil, and soil gas. During this and other investigations, the following contaminants of concern have been identified: 1,1-dichloroethene (1,1-

DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloroethane (1,1,2-TCA), trichloroethene (TCE), tetrachloroethene (PCE), and carbon tetrachloride (carbon tet) .

Chlorinated solvents are the principle contaminants present at the site. Contaminants were released to the environment from storage tanks or improper disposal practices. Soil contamination, including visible staining and free product, exists from approximately 25 to 37 feet below ground surface (bgs) in the east and west portion of the excavation area, and from just below the surface to 37 feet bgs in the central portion of the excavation where waste was thought to have been placed on the ground. Groundwater samples collected from the aquifer in the overburden soil revealed that chlorinated solvent contamination was present in the groundwater. Groundwater is encountered at approximately 30 feet bgs.

Southeast Rockford Superfund Site is comprised of three operable units (OU). Operable units are delineated by drinking water, groundwater, and source control constituents. The three operable units are as follows:

- Operable Unit 1 (OU1): Drinking Water Operable Unit
- Operable Unit 2 (OU2): Groundwater Operable Unit
- Operable Unit 3 (OU3): Source Control Operable Unit

Operable Unit 3 is the subject of the remedial design. Operable Unit 3 includes four contaminant source areas, Areas 4, 7, 9/10, and 11. The four areas are designated as Source Control Operable Units (SCOU). Area 4 is the focus of study for this PSVP.

Area 4 consists of a building and a parking lot that formerly housed a Swebco Manufacturing, Inc. machine shop. Presently, the building is used as a wood pallet manufacturing and refurbishing operation.

1.2 Project Summary

Remedial action will be implemented at the site in Area 4 to remove the source of chlorinated solvent contamination. Remedial action will consist of soil excavation, treatment of contaminated soil, and leachate containment and treatment of the affected area (Area 4), to address the soil and groundwater contamination. Contaminated soil will be excavated and treated by low temperature thermal desorbtion (LTTD) then returned as backfill to the soil excavation. Uncontaminated overburden, where it exists, will be stockpiled and returned to the excavation. Dewatering of the soil excavation will occur during excavation activities. Temporary wells will be installed in the vicinity of soil excavation for dewatering. Contaminated groundwater from dewatering will be pumped to an onsite air stripper unit for treatment and subsequently, effluent water will be discharged to the concrete-lined drainage ditch immediately north of the site.

Following completion of the soil excavation and LTTD treatment activities, monitoring wells will be installed in the vicinity of the soil excavation to obtain

groundwater samples for laboratory analysis to monitor contaminants in the groundwater following remedial action.

Finally, extraction wells will be installed downgradient of the excavation for long-term hydraulic containment of leachate. Extracted leachate will be pumped to an onsite air stripper unit for treatment and subsequently, effluent water will be discharged to the concrete-lined drainage ditch immediately north of the site.

1.3 Purpose

The purpose of the Performance Standards Verification Plan is to provide a mechanism to ensure that both short-term and long-term performance standards of the remedial action are met. The Contractor will be responsible to see that the short-term performance standards are achieved and the Operations and Maintenance Contractor will be responsible to see that the long-term performance standards are achieved.

1.4 Short-Term Performance Standards Items

Short-term performance standards items consist of monitoring the total amount of material removed from the excavation area, determining the amount of contaminated soil removed from the excavation area, determining the amount of contaminated soil left in place, analysis of treated water that will be produced during dewatering activities, analysis of low temperature thermal desorbtion (LTTD) treated soil and compaction testing of backfilled soil. These items must be completed successfully before subsequent activities can proceed for remedial action. The Contractor shall be responsible to ensure that these items are performed to the acceptable standards.

The vertical extent of contamination in not completely defined in portions of the excavation area. Part of this PSVP is to determine the material that will require LTTD treatment. In addition, prior to backfilling the excavation area, confirmation samples must be taken at the walls and base of the excavation to determine if any contaminated material is left in place. The LTTD-treated soil will be used to backfill the soil excavation; therefore, this soil must be analyzed for volatile organic compound concentrations. Volatile organic compound constituent concentrations of the LTTD-treated soil must be below the remediation goals established in the ROD prior to using the LTTD-treated soil as backfill material.

During backfill operations, compaction tests must be performed on compacted soil within the soil excavation. Backfilled soil will be placed into the soil excavation in 6 inch layers referred to as "lifts". Each 6 inch layer of backfill soil placed into the soil excavation must meet compaction criteria, before the next 6 inch lift can be placed in the excavation. Each lift of soil will be compacted using a vibratory roller. Subsequently, compaction tests of soil will be performed for each lift. Each lift must meet the compaction criteria standards before additional backfill may be placed into the excavation.

The effluent from the packaged water treatment system for the dewatering water will be discharged into the drainage ditch located to the north of the site. Volatile organic compound constituent concentrations of the effluent must be below the discharge criteria established in the ROD prior to discharge.

1.5 Long-Term Performance Standards Items

Long-term performance standards items consist of groundwater sampling and effluent sampling. Effluent must meet the discharge requirements established in the ROD and the groundwater must meet the remediation goals prior to leaving the Groundwater Management Zone (GMZ). The Operations and Maintenance Contractor shall be responsible to ensure that the remedial action is performed to the acceptable standards.

2 Section Two

Section 2
Short-Term Performance Standards

Short-term performance standards must be achieved for the excavated soil, dewatering water, low temperature thermal desorbtion (LTTD) treated soil and backfilled soil, during remedial action activities. During excavation activities, the delineation between "clean" overburden soil and contaminated soil must be determined. The overburden soil and treated soil will be used for backfilling the excavation area and must pass the performance standards provided in the following sections. The vertical limits of the excavation are limited based on the dewatering and structural support requirements. Prior to backfilling the excavation, the base and walls of the excavation must be sampled to determine what if any contamination remains in place. This information will be used in meeting the long-term performance standards. The treated soil and compacted soil must meet the applicable performance standards before subsequent activities can proceed for remedial action. The effluent from the packaged water treatment system for the dewatering water will be discharged into the drainage ditch located to the north of the site. The effluent must meet the applicable performance standards prior to discharge. The Contractor shall be responsible to ensure that the aforementioned items are performed to the acceptable standards.

2.1 Short-Term Performance Standards Items List

The following short-term performance standards must be evaluated to determine the effectiveness of the Remedial Action. These items must be completed before subsequent activities can be performed.

2.1.1 Contaminated Soil Determination

The site consists of overburden soil which covers a layer of contaminated soil which extends below the water table. The performance standard verification for the contaminated soil determination is used to determine which soil must be treated using the LTTD treatment system. Soil with concentrations above the Remediation Goals will be treated. A field sampling kit or a field gas chromatograph will be used to make the determination between overburden and contaminated soil as described in the Quality Assurance Project Plan and Sampling and Analysis Plan (QAPP/SAP).

2.1.2 LTTD-Treated Soil

The LTTD-treated soil will be used to backfill the soil excavation; therefore, this soil must be analyzed for volatile organic compound concentrations. Volatile organic compound constituent concentrations of the LTTD-treated soil must be below remediation goals established in the ROD prior to using the LTTD-treated soil as backfill material. Treated soil will be sampled and analyzed as required in the QAPP/SAP, and the Remedial Design Specifications. Treated soil will be analyzed by a National Environmental Laboratory Accreditation Conference (NELAC) Certified Laboratory.

2.1.3 Excavation Area Confirmation Testing

The excavation area is limited by structural and dewatering requirements; therefore, defining the extent of contaminated soil that may be left in place must be part of the PSVP. Soil samples will be taken at the walls and base of the excavation as required in the QAPP/SAP and the Remedial Design Specifications and analyzed for VOCs. Soil Samples will be analyzed by a NELAC Certified Laboratory.

2.1.4 Compaction Tests of Backfilled Soil

During backfill operations, compaction tests as specified in Section 02200 of the specifications must be performed on compacted soil within the excavation area. Overburden soil and treated soil will be placed into the excavation area in 6-inch layers referred to as "lifts". Each 6-inch layer of soil placed into the excavation area must meet compaction criteria as determined by ASTM D1557, Method D, before the next 6-inch lift can be placed in the excavation. Each lift of soil will be compacted using a vibratory roller. Subsequently, compaction tests of soil will be performed for each lift. Each lift must meet the compaction criteria standards as per section 02200 of the specifications before additional soil may be placed into the excavation. If a lift of soil does not meet the compaction criteria, then additional compaction via the vibratory roller is necessary.

2.1.5 Leachate Concentrations

Samples will be collected daily at a minimum from the air stripper influent during dewatering to determine the effectiveness of the air stripper. The samples will be collected and analyzed by a NELAC-certified laboratory. The results of the laboratory analysis of the influent will be compared to the effluent concentrations of the air stripper to determine if the treatment system is performing as designed.

2.1.6 Air Stripper Effluent Concentrations

The air stripper effluent concentrations during dewatering will be collected daily to determine the effectiveness of the air stripper. The samples will be collected daily throughout the dewatering activities and analyzed by a NELAC-certified laboratory. The results of the laboratory analysis will be compared to the influent concentrations of the air stripper to determine if the treatment system is performing as designed. The effluent will also be compared to the discharge requirements established in the ROD.

2.2 Completion Verification

Completion verification that air stripper effluent, low temperature thermal desorbtion (LTTD) treated soil, confirmation samples, and backfilled soil meet the short-term performance standards will be performed using laboratory analysis and compaction testing. The confirmation samples and treated soil will be analyzed for volatile organic compounds by the NELAC-certified laboratory as described in the QAPP/SAP. Analytical data will be compared to the remedial goal established in the

ROD, for each VOC constituent of concern. Treated soil that meets the remediation goals will be used to backfill the soil excavation. The results of the confirmation samples will be used to determine the amount of contamination left in place and to help in determining the long-term treatment parameters. The remediation goals established in the ROD are provided below:

Analytical Parameter	Soil Remediation Goal (mg/kg)	Effluent Discharge Requirements (µg/L
1,1,1-TCA	9.118	390
1,1,2-TCA	0.02	12
1,1-DCE	0.06	0.95
Carbon Tet	0.07	0.95
PCE	0.06	2.8
TCE	0.06	25

Compaction testing of each 6-inch lift of compacted soil will be performed by the Contractors independent testing firm under the direction of Illinois EPA's Representative. Results of the compaction test will be compared to established compaction limits of the proctor sample. (Note: Compaction limits cannot be listed at this time. Compaction limits will be determined when the proctor sample is submitted for analysis.) Each lift of compacted soil must have compaction within the compaction limits, before the next lift of backfill soil can be placed into the soil excavation.

2.3 Completion Reports

Analytical laboratory data sheets and compaction test field sheets will be attached to Inspection Data Sheets as described in Section 6.3.1.2 of the Construction Quality Assurance Plan (CQAP) and will serve as the completion reports for the short-term performance standards. Additionally, the remediation goals, discharge requirements, and the proctor sample compaction limits will be attached to the laboratory data sheets and field sheets, respectively.

3 Section Three

Section 3
Long-Term Performance Standards

Long-term performance standards must be achieved for groundwater prior to leaving the GMZ and effluent water samples, to meet remedial action objectives. Quarterly leachate and groundwater sampling will be performed for a period of two years and effluent water samples will be collected periodically during operations of the air stripper unit. Groundwater and effluent water samples will be analyzed for VOCs by a NELAC certified laboratory. For each volatile organic compound constituent of concern, analytical data will be compared to the remediation goals. To achieve long-term performance standards, groundwater must have constituent concentrations below the remediation goals prior to leaving the GMZ and effluent must be below the discharge remediation goals prior to discharging to the stormwater drainage ditch. The Operations and Maintenance Contractor shall perform the groundwater and effluent sampling and will be responsible to review analytical data results to determine if long-term performance standards are met.

3.1 Long-Term Performance Standards Items List

The following long-term performance standards must be evaluated to determine the long-term performance of the Remediation Design.

3.1.1 Leachate Concentrations

Samples will be collected during leachate containment from the air stripper influent to determine the effectiveness of the air stripper. The samples will be collected quarterly for two years and analyzed by a NELAC-certified laboratory. The results of the laboratory analysis will be compared to the effluent concentrations of the air stripper to determine if the treatment system is performing as designed.

3.1.2 Air Stripper Effluent Concentrations

The air stripper effluent concentrations will be collected quarterly at the same time as the influent samples during operation of the leachate control system to determine the effectiveness of the air stripper. The samples will be collected for two years and analyzed by a NELAC-certified laboratory. The results of the laboratory analysis will be compared to the influent concentrations of the air stripper to determine if the treatment system is performing as designed. The effluent will also be compared to the discharge requirements established in the ROD.

3.1.3 Monitoring Well Concentrations

The monitoring well concentrations will be compared to the remediation goals established in the ROD. The samples will be collected quarterly for two years and analyzed by a NELAC-certified laboratory. The results of the laboratory analysis will be compared to remediation goals established in the ROD. The monitoring well in the excavation area will be used to determine the extent of contamination present in the source area. The monitoring wells downgradient of the extraction wells will be used

to determine the effectiveness of the extraction wells in containing the groundwater contamination.

3.2 Completion Verification

Completion verification will be determined based on the results of the long-term performance standards evaluation of the leachate, effluent, and the monitoring well samples. The leachate, effluent, and the monitoring well samples will be analyzed for VOCs by a NELAC certified laboratory. Analytical data for the leachate and the monitoring well samples will be compared to the groundwater remediation goals and the analytical data for the effluent will be compared to the effluent discharge requirements for each VOC contaminant of concern. Each contaminant of concern and the performance standards are provided below:

Analytical Parameter	Groundwater Remediation Goals (µg/L)	Effluent Discharge Requirements (µg/L)
1,1,1-TCA	200	390
1,1,2-TCA	5	12
1,1-DCE	7	0.95
Carbon Tet	5	0.95
PCE	5	2.8
TCE	5	25

Samples will be collected from monitoring wells in the vicinity of the former soil excavation, to monitor groundwater conditions for the presence of contaminants, following soil remedial action. Effluent water samples will be obtained quarterly or more frequently if required by permit during the entire time the air stripper unit is in operation. Effluent water from the air stripper unit is discharged directly to the stormwater drainage ditch. Analysis of effluent water samples will determine if effluent water samples meet the discharge requirements and will be used to monitor the efficiency of the air stripper unit. Samples will also be collected from monitoring wells upgradient of the edge of the GMZ to determine if the extraction wells are containing the leachate from the source area.

3.3 Completion Reports

Analytical laboratory data sheets will be attached to the Inspection Data Sheets as described in Section 6.3.1.2 of the CQAP and will serve as the completion reports for the long-term performance standards. Additionally, the remediation goals and discharge requirements will be attached to the laboratory data sheets. During the entire time the air stripper unit is in operation, effluent samples will be collected periodically for laboratory analysis. Quarterly groundwater sampling will be performed to determine the VOC content in the groundwater, following the soil excavation remedial action.

4

Section Four

Section 4
Oversight of Performance Standards

Illinois EPA's Representative will perform oversight of short-term performance standards and oversight of the long-term performance standards. The Contractor shall obtain laboratory analytical data of soil samples and compaction tests field data, to evaluate short-term performance standards during remedial action. Upon receipt of soil data, the Contractor will inform any applicable subcontractors and IEPA if soil standards are met, in order to facilitate field activities. To evaluate long-term performance standards, the Operations and Maintenance (O&M) Contractor will examine laboratory analytical data of water samples. The O&M Contractor will notify the Illinois EPA regarding compliance of water data to the long-term performance standards.

4.1 Personnel & Roles

For performance standards oversight, each contractor will assign qualified personnel to perform the required tasks. The contractor project manager will evaluate the data to determine if performance standards are met. Each contractor will be responsible for collection of soil, groundwater, and effluent samples for laboratory analysis. The Contractor may hire subcontractors to perform laboratory analysis and compaction testing of soil. Personnel and their roles are as follows:

Personnel	Role
Contractor Project Manager	Performance Standards Evaluation
Contractor	Sample Collection
NELAC Certified Laboratory	Sample Analysis
Proctor	*Compaction Testing*

4.2 Milestones

Each Contractor will track milestones during the course of the remedial action/remedial design project. Soil must meet soil remediation goals and compaction test criteria to achieve the short-term milestones. Soil must comply with the aforementioned standards and criteria, in order for field remedial activities to proceed to completion. Groundwater and effluent water must meet the groundwater remediation goals and the discharge requirements to achieve the long-term milestones. Effluent samples will be obtained periodically while the air stripper unit is in operation. Quarterly groundwater sampling will be performed for a minimum of two years. Groundwater analytical data will be examined to determine if long-term milestones are met.

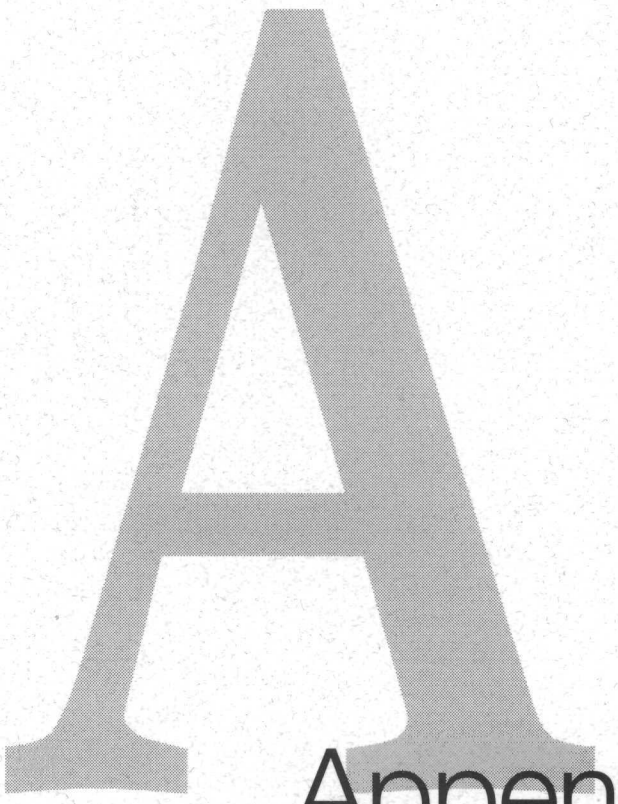
4.3 Communication

Each Contractor will be responsible for communication to the applicable parties regarding performance standards. Upon receipt of data, the Contractor will

immediately inform the soil excavation subcontractor, if applicable, and IEPA if soil meets the required performance standards. Subsequently, the Remediation Contractor will present the soil data in a report to the IEPA. The O&M Contractor will prepare a report regarding groundwater and effluent data, for submittal to the IEPA.

4.4 Document Management

Each Contractor will follow the procedures set forth in Section 6.6 of the CQAP for document control. Additionally the Contractor will maintain and store all documents relating to performance standards, for proper document management. All laboratory data, compaction test field data sheets, and reports will be stowed in a specific file designated for Area 4 of the Southeast Rockford Superfund site. This file must be maintained for a period of 30 years, as specified by IEPA protocol.



Appendix A

Illinois Environmental Protection Agency

Quality Assurance Project Plan
Source Area 4 Remedial Design
Southeast Rockford Groundwater Contamination Site

September 13, 2004

Draft Final Appendix A

Contents

Section 9 - Instrument/Equipment Calibration and Maintenance

Section 10 - Data Management, Validation and Usability

Section 11 – Assessment and Oversight

Section 1
Introduction

The Draft Final Remedial Design (RD) Quality Assurance Project Plan (QAPP) presents the sample analysis and data handling for the collection of soil and water samples as required by the plans and specifications for the remedial action at Area 4. This Draft Final RD QAPP for Area 4 of the Southeast Rockford Superfund Site will be submitted as part of the "Pre-Final" design package to the Illinois Environmental Protection Agency (EPA), as specified in the Southeast Rockford Superfund Site Remedial Design Work Plan, prepared by Camp Dresser & McKee (CDM).

The Draft Final RD QAPP has been developed following incorporation of Illinois EPA and USEPA comments on the "Intermediate" design. The Final RD QAPP will be completed by the Contractor and submitted with the Final Design package to the Illinois EPA.

The Record of Decision (ROD) for the Southeast Rockford Superfund site was signed by the Region V Administrator of the United States Environmental Protection Agency (U.S. EPA), on June 11, 2002. Under contract to the Illinois EPA, CDM will follow the ROD, the approved Statement of Work (SOW), and the approved Remedial Design (RD) for remedial action at Area 4 for the site. Southeast Rockford Groundwater Contamination Superfund Site is identified by the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) identification number of ILD981000417.

1.1 Project Description

In 1981, the City of Rockford discovered groundwater contamination at the property that became the Southeast Rockford Superfund site. In 1981 to 1997, the Illinois EPA and the Illinois Department of Public Health (IDPH) performed investigations at the site that revealed that volatile organic compound (VOC) contaminants were present in the groundwater, soil, and soil gas. During this and other investigations, the following contaminants of concern have been identified: 1,1-dichloroethene (1,1-DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloroethane (1,1,2-TCA), trichloroethene (TCE), tetrachloroethene (PCE), and carbon tetrachloride (carbon tet) .

Chlorinated solvents are the principle contaminants present at the site. Contaminants were released to the environment from storage tanks or improper disposal practices. Soil contamination, including visible staining and free product, exists from approximately 25 to 37 feet below ground surface (bgs) in the east and west portion of the excavation area, and from just below the surface to 37 feet bgs in the central portion of the excavation where waste was thought to have been placed on the ground. Groundwater samples collected from the aquifer in the overburden soil revealed that chlorinated solvent contamination was present in the groundwater. Groundwater is encountered at approximately 30 feet bgs.

Southeast Rockford Superfund Site is comprised of three operable units (OU). Operable units are delineated by drinking water, groundwater, and source control constituents. The three operable units are as follows:

- Operable Unit 1 (OU1): Drinking Water Operable Unit
- Operable Unit 2 (OU2): Groundwater Operable Unit
- Operable Unit 3 (OU3): Source Control Operable Unit

Operable Unit 3 is the subject of the remedial design. Operable Unit 3 includes four contaminant source areas, Areas 4, 7, 9/10, and 11. The four areas are designated as Source Control Operable Units (SCOU). Area 4 is the focus of study for this QAAP.

Area 4 consists of a building and a parking lot that formerly housed a Swebco Manufacturing, Inc. machine shop. Presently, the building is used as a wood pallet manufacturing and refurbishing operation.

1.2 Project Summary

Remedial action will be implemented at the site in Area 4 to remove the source of chlorinated solvent contamination. Remedial action will consist of soil excavation, treatment of contaminated soil, and leachate containment and treatment of the affected area (Area 4), to address the soil and groundwater contamination. Contaminated soil will be excavated and treated by low temperature thermal desorbtion (LTTD) then returned as backfill to the soil excavation. Uncontaminated overburden, where it exists, will be stockpiled and returned to the excavation. Dewatering of the soil excavation will occur during excavation activities. Temporary wells will be installed in the vicinity of soil excavation for dewatering. Contaminated groundwater from dewatering will be pumped to an onsite air stripper unit for treatment and subsequently, effluent water will be discharged to the concrete-lined drainage ditch immediately north of the site.

Following completion of the soil excavation and LTTD treatment activities, monitoring wells will be installed in the vicinity of the soil excavation to obtain groundwater samples for laboratory analysis to monitor contaminants in the groundwater following remedial action.

Finally, extraction wells will be installed downgradient of the excavation for long-term hydraulic containment of leachate. Extracted leachate will be pumped to an onsite air stripper unit for treatment and subsequently, effluent water will be discharged to the concrete-lined drainage ditch immediately north of the site.

1.3 Objectives

Objectives of the remedial action are to remove the contaminated soils and leachate from within the main source area at Area 4. Sampling of various media and field and laboratory analysis for VOCs will be required per the design specifications. The

analytical data to be used to verify cleanup will be compared to the remediation goals set forth in the ROD. As such, this data must be of sufficient quality to ensure that the remediation goals have been met. This QAPP is designed to ensure that the data collected for this purpose are of sufficient quality to meet that objective.

During excavation of the contaminated soils, soil samples will be collected from the estimated limits of the excavation and tested in the field to determine if excavation is complete. Confirmatory soil samples will be collected from the final limits of the excavation and sent for laboratory analysis to determine what contamination if any is left in place. The excavated, treated soils will undergo composite sampling and analysis for VOCs. These sample results will be compared to the soil remediation goals before being allowed to be used as fill. Any treated soils exceeding the goals will be retreated and re-tested prior to being used as fill.

During excavation, dewatering of the excavation will occur. This water will be sampled before it is treated by the air stripper and after it is treated by the air stripper. The influent and effluent results will be compared to determine stripper effectiveness and the effluent will be compared to the effluent discharge requirements before being discharged to the drainage ditch. After completion of the excavation, the air stripper will continue to receive leachate from within the Area 4 source area. This effluent will be monitored over a period of two years for VOCs and the results compared to the effluent discharge criteria.

Monitoring wells will be installed with in Area 4 and downgradient from the leachate control system in Area 4 to monitor the condition of the groundwater and the effectiveness of the leachate control system. The data from the monitoring wells will be compared to the groundwater remediation goals.

Section 2
Project Responsibilities

The general organizational structure and project responsibilities for the remedial action at Area 4 is described in Section 2.0 of the Construction Quality Assurance Project Plan. It will be the responsibility of the Contractor to finalize this section with a detailed description of the organizational structure and personnel specific to the data gathering activities for this remedial action as described in Section 1 of this QAPP. At a minimum this must include:

- Management responsibilities
- QA Responsibilities
- Field Responsibilities
- Laboratory Responsibilities

Any special training or certification requirements for the project should be described as well. An organization chart should be included that indicated lines of authority and communication.

Section 3
Quality Objectives and Criteria

This section provides internal means for control and review of data collection activities so that the data collected are of known and acceptable quality to achieve the project objectives. The objectives for each data gathering activity are described. This section shall be finalized by the Contractor prior to start of construction.

3.1 Remediation Goals

The Record of Decision (ROD) for the Source Control Operable Unit for the Southeast Rockford Superfund site was signed by the Region V Administrator of the United States Environmental Protection Agency (U.S. EPA), on June 11, 2002. This ROD specified both soil and groundwater remediation goals. Subsequent to the approval of the ROD and as part of the pre-design activities, effluent discharge limits were also established for this project that apply to any waters discharged into the stormwater drainage system. The table below provides these goals and requirements that will be the criteria against which analytical data collected for cleanup verification will be compared.

Table 3-1

Analytical Parameter	Groundwater Remediation Goals (ug/L)	Soil Remediation Goals mg/kg	Effluent Discharge Requirements (ug/L)
1,1,1-TCA	200	9.118	390
1,1,2-TCA	5	0.02	12
1,1-DCE	7	0/06	0.95
Carbon Tet	5	0.07	0.95
PCE	5	0.06	2.8
TCE	5	0.06	25

3.1.1 Soil

During excavation of the contaminated soils, soil samples will be collected from the estimated limits of the excavation and tested in the field to determine if excavation is complete. This testing will be performed using either using a field test kit for VOCs or a field GC, which ever is capable of reaching a detection limit of 9 mg/kg for 1,1,1-TCA. This parameter has been chosen as the indicator parameter as it is the most prevalent contaminant at the site and is found at the highest concentrations. The excavation will be considered complete and ready for backfilling if the 1,1,1-TCA concentrations are 9 mg/kg or less or the conditions as specified in Section 02200 of the specifications have been met. Due to site conditions such as groundwater, utilities, existing structures, property boundaries and soil conditions it may not be possible to remove all contamination above 9 mg/kg 1,1,1-TCA.

Confirmatory soil samples will be collected from the final limits of the excavation and sent for laboratory analysis for VOCs to determine what levels of contamination, if any, is left in place. If the excavation has proceeded to the physical limits, no action will be taken if these soils exceed the soil remediation goals.

The excavated, treated soils will undergo composite sampling and analysis for VOCs. These sample results will be compared to the soil remediation goals before being allowed to be used as fill. Any treated soils exceeding the goals will be retreated and re-tested prior to being used as fill.

3.1.2 Groundwater & Effluent

During excavation, dewatering of the excavation will occur. This water will be sampled before it is treated by the air stripper and after it is treated by the air stripper. The influent and effluent results will be compared to determine stripper effectiveness and the effluent will be compared to the effluent discharge requirements before being discharged to the drainage ditch. If effluent concentrations do not meet the discharge criteria then adjustments will be made to the air stripper operations to improve the VOC removal efficiency.

After completion of the excavation, the air stripper will continue to receive leachate from the leachate control system to be installed within the Area 4 source area. This effluent will be monitored over a period of two years for VOCs and the results compared to the effluent discharge criteria. If effluent concentrations do not meet the discharge criteria then adjustments will be made to the air stripper operations to improve the VOC removal efficiency.

Monitoring wells will be installed with in Area 4 and downgradient from the leachate control system in Area 4 to monitor the condition of the groundwater and the effectiveness of the leachate control system. The data from the monitoring wells will be compared to the groundwater remediation goals. The goal for monitoring wells within the groundwater management zone (GMZ) is that they begin to approach the groundwater remediation goal concentrations once the source removal operations are complete. Monitoring wells outside of the GMZ should be at or below the groundwater remediation goals and if they do exceed these levels the leachate control system may require adjustment.

3.2 Measurement of Performance Criteria

The Contractor will make every reasonable attempt to obtain a complete set of usable field measurements and analytical data. If a measurement cannot be obtained or is rejected for any reason, the effect of the missing data will be evaluated by Illinois EPA's Representative. In addition, the SAP provides guidance to ensure that the samples obtained are representative of the media at the site.

The field QA program has been designed in accordance with USEPA's Guidance for the DQO Process, and the USEPA Region V Instructions on the Preparation of a Superfund Division Quality Assurance Project Plan, Revision 0, June 2000.

Precision, accuracy, representativeness, completeness, and comparability (PARCC) parameters are indicators of data quality. PARCC goals are established for the data gathering activities to aid in assessing data quality. The following paragraphs define these PARCC parameters in conjunction with this project.

Precision. The precision of a measurement is an expression of mutual agreement among individual measurements of the same property taken under prescribed similar conditions. Precision is quantitative and most often expressed in terms of relative percent difference (RPD).

Precision of the laboratory analysis can be assessed by comparing the analytical results and the laboratory duplicate results. The RPD can be calculated for each pair of duplicate analyses using the following equation:

$$RPD = *S - D*/(S + D)/2 \times 100$$

where:

S = First sample value (original value); and

D = Second sample value (duplicate value).

Precision of reported results is a function of inherent field-related variability plus laboratory analytical variability, depending on the type of QC samples. Field duplicate samples will be collected to provide a measure of the contribution to overall variability of field-related sources. Acceptable RPD limits for field duplicate measurements will be plus or minus 35 percent (%) for aqueous samples and 50% for solid samples. Field duplicates will be collected at a frequency of 1 per 10 investigative samples. Data will not be rejected based on the agreement between field duplicates. Contribution of laboratory-related sources to overall variability will be measured through various laboratory QC samples.

Accuracy. Accuracy is the degree of agreement of a measurement with an accepted reference or true value and is a measure of the bias in a system. Accuracy is quantitative and usually expressed as the percent recovery (%R) of a sample result. The %R is calculated as follows:

$$\%R = SSR - SR / SA \times 100$$

where:

SSR = Spiked Sample Result

SR = Sample Result

SA = Spike Added

Ideally, it is desirable that the reported concentration equals the actual concentration present in the sample. Analytical data can be evaluated for accuracy using MSs and LCSs. These QC samples will be analyzed at a rate of 1 per 20 investigative samples.

Representativeness. Representativeness expresses the degree to which sample data represent:

The characteristic being measured

Parameter variations at a sampling point, and/or

An environmental condition

Representativeness is a qualitative parameter that is most concerned with the proper design of the sample plan and sampling procedures and the absence of sample contamination. Acceptable representativeness will be achieved through (1) careful, informed selection of sampling sites, (2) selection of testing parameters and methods that adequately define and characterize the extent of possible contamination and meet the required parameter reporting limits, (3) proper collecting and handling of samples to avoid interferences and prevent contamination and loss, and (4) collection of a sufficient number of samples to allow characterization. Representativeness is a consideration that will be employed during all sample location and collection efforts. The representativeness can be assessed qualitatively by reviewing the procedures and design of the sampling event, by the establishment and consistent use of SOPs, and quantitatively by reviewing the laboratory blank samples. If an analyte is detected in a laboratory blank, any associated positive result less than five times may be considered undetected.

Completeness. Completeness is a measure of the amount of usable data obtained from a measurement system compared to the amount that was expected to be obtained under correct normal conditions. Usability will be determined by evaluation of the PARCC parameters excluding completeness. Those data that are evaluated and not rejected are usable. Completeness will be calculated following data evaluation. A completeness goal of 90% is projected for the data set collected for the activities at the Site. Completeness will be calculated for the combined data from all sampling events performed during the activities at the Site; completeness will also be calculated for the screening activity and for the indoor air sampling activity. If the completeness goal of 90% is not met, additional sampling may be necessary to adequately achieve project objectives. Completeness is calculated using the following equation:

$$\% \text{ Completeness} = (DO/DP) \times 100$$

where:

DO = Data Obtained and usable.

DP = Data Planned to be obtained.

Comparability. Comparability is a qualitative parameter. Consistency in the acquisition, handling, and analysis of samples is necessary for comparison of results. Data developed under this investigation will be collected and analyzed using EPA-approved analytical methods and QC measures to ensure comparability of results with other analyses performed in a similar manner.

Sensitivity. Sensitivity, although not a PARCC parameter, will be evaluated for this project. The achievement of MDLs depends on instrument sensitivity and matrix effects. Therefore, it is important for the laboratory to monitor the sensitivity of data-gathering instruments to ensure the data quality through constant instrument performance. Instrument sensitivity will be monitored by the laboratory through the analysis of preparation blanks. CDM will evaluate sensitivity during the entire project by ensuring that reporting limits are below or approach acceptable criteria. Sensitivity criteria are specified in Table 3-1 and in the analytical methods to be supplied by the Contractor before construction begins..

3.3 Analytical Methodology

CDM will be responsible for verifying that the certified laboratory analyzed the soil and water samples using the proper analytical methodology, to maintain quality assurance objectives. CDM will study analytical methodology which will included analytical methods, holding times, and detection limits, for each contaminant constituent of concern.

3.3.1 Analytical Methods

CDM will examine the analytical methods that the certified laboratory uses to analyze soil and water samples. Contaminant constituents of concerned must be analyzed using the proper Illinois EPA-approved analytical method. CDM will document the proper analysis on the chain-of-custody form for the laboratory samples. Subsequently, CDM will study the laboratory data forms to confirm that samples were analyzed using the proper analytical method.

3.3.2 Holding Times

CDM will inspect laboratory documents for the holding times for each soil, groundwater, and effluent water sample collected for laboratory analysis. Soil and water samples must be analyzed within a specified holding time, from the time of sample collection to laboratory analysis, for each analytical method. Samples must be analyzed within the allotted holding time, for laboratory analysis to be valid. Each analytical method has a predetermined holding time. Volatile organic compound analysis has a holding time of not more than 14 days from the time of collection to laboratory analysis. CDM will review laboratory data results to check that samples were analyzed within the proper holding time.

3.3.3 Detection Limits

CDM will determine that samples were analyzed using the proper laboratory detection limit, for each contaminant of concern. The certified laboratory will perform

analysis of samples using a predetermined laboratory detection limit, for each contaminant of concern of a requested analysis. Additionally, the laboratory detection limit for each contaminant of concern must be at or below the corresponding Illinois EPA soil or water standard, to ensure that remediation goals are met. CDM will review laboratory data results to check that samples were analyzed using appropriate detection limits.

Section 4
Documentation and Records

4.1 Field Records and Reporting

The Contractor will document field activities relating to data gathering activities for the remedial action in a field notebook. Data gathering activities include ambient air monitoring, soil monitoring, soil sampling, monitoring well installation, groundwater sampling, and influent and effluent sampling. The Contractor shall develop a procedure documenting all sample collection, QC sample collection and field monitoring/analysis records that is consistent with the documentation requirements set forth in Section 6.0 of the CQAP. These procedures shall be documented in the SAP for this project and referenced appropriately in this section. They must include at a minimum, information regarding proper use of field log books, sample identification procedures and discussion and examples of sample documentation forms to be used for the project.

4.2 Laboratory Records and Reporting

The Contractor must document in this subsection what laboratory-specific records will be compiled for this project. Such records may include as appropriate: COC records; sample receipt/tracking forms; preparation and analysis forms; tabulated data summary and raw data for samples; standards; QC samples; corrective action reports. The contractor must define in this section the data handling records for the field/fixed laboratories to include the protocols to be used in data reduction, verification and validation. The data package format, internal laboratory document control and procedures for storage and retrieval of data shall be specified for both field and laboratory analysis in this section. It is appropriate to reference or include the pertinent section of the project laboratory QA manual to document these procedures.

Section 5
Sampling Design and Methods

The sampling plan for data gathering for the Area 4 Remedial Action was designed to provide real time data for air monitoring , provide screening level field data to allow personnel to make decisions regarding completion of work, to evaluate the operation of various remedial systems in place and to confirm that clean-up has been achieved. The sampling requirements are described in general in the plans and specifications. The Contractor must provide a detailed description of each required sampling activity and the rationale for the sampling location, sample frequency analytical parameters and QC samples. This should be included in the SAP and referenced to this Section of the QAPP. Tables should be included that provide at a minimum the media to be sampled, number of investigative samples, number and type of QC samples for each matrix, sample container requirements, and sample preservation requirements. This QAPP section must include a schedule of the sampling activities to be conducted for the project.

5.1 Sampling Procedures

The Contractor must provide step-by-step Standard Operating Procedures (SOPs) for all sampling activities to be conducted. These procedures should be included in the SAP and referenced in this section. SOPs must include equipment types, sample media, analytical parameters, sample containers, QC requirements and sample preservation at a minimum. A list of all field equipment for health and safety, sampling, documentation and decontamination should be included in this section or referenced in the SAP.

5.2 Cleaning and Decontamination

The Contractor shall provide in this subsection procedures for initial cleaning and decontamination of all sampling equipment to be used for this project. These procedures may be submitted as SOPs and should include procedure for decontamination, frequency of decontamination, criteria to determine effectiveness of decontamination and disposal of decontamination by-products. The procedures for sample bottle cleaning, decontamination, inspection and acceptance shall also be included. These may also be submitted as SOPs and must include the procedures that will be followed to ensure that sample containers and supplies are free of contaminants of concern or other interferences.

Section 6
Sample Handling and Custody Requirements

The Contractor shall describe in this section all procedures to be followed to insure that:

- Samples are collected, transferred, stored and analyzed by authorized personnel;
- Sample integrity is maintained at all times during sample handling and analysis; and

Accurate written records are maintained for sample handling and treatment form collection through disposal.

6.1 Sample Handling

The Contractor must describe the sample numbering system to be used for this project so that each sample can be uniquely identified. A description of how samples will be delivered or shipped to laboratories, either on-site or off-site must be provided. Copies of all sample shipment forms should be provided. A table should be provided that includes information on sample volumes, container types, number of containers, preservation and holding times for each analytical parameter grouping for each matrix. This information should be provided in the SAP and may be referenced here.

6.2 Sample Custody

COC procedures and sample shipment will follow the requirements stated in the Sampler's Guide to the CLP and in the USEPA Region V Instructions on the Preparation of a Superfund Division QAPP as described in Element B3 as well as any other requirements specific to the laboratory for this project. The COC record is employed as a physical evidence of sample custody and control. This record system provides the means to identify, track, and monitor each individual sample from the point of collection through final data reporting. COC record is employed as physical evidence of sample custody and control. A completed COC record is required to accompany each shipment of samples. An example COC form should be provided by the Contractor in this section. The Contractor shall provide the field custody procedures to be followed in this section. Reference to an SOP is acceptable. The detailed laboratory custody procedures for each laboratory used for this project must also be included. It is appropriate to include and reference laboratory SOPs or pertinent sections of their QA manual for this information.

The Contractor field personnel responsible for maintaining the COC should be identified in this section. Responsible laboratory personnel must also be identified and if appropriate include the laboratory organizational charts.

Section 7
Analytical Methods Requirements

Samples collected during this project will be analyzed in accordance with standard USEPA and/or nationally recognized analytical procedures. The purpose of using standard procedures is to provide analytical data of known quality and consistency. Analytical laboratories will adhere to QC requirements as established by USEPA methods.

The Contractor must include in this section all field, on-site laboratory and off-site laboratory procedures to be used for this project. This section must include the information described in USEPA Region V Instructions on the Preparation of a Superfund Division QAPP, Element B4. In summary this includes:

- Analytical parameters and matrices to be tested by each laboratory
- SOPs for sample preparation and clean-up
- SOPs for all analyses to be performed during the project
- SOP for method validation studies/detection limit studies
- Quantities and types of QC samples to be collected and analyzed for each analyte group and matrix

These SOPs must include a step-by step description of the procedure, specify QA checks, QC acceptance criteria, and corrective actions. The laboratory and field analytical methods selected must be capable of achieving reporting limits below the soil and groundwater remediation goals and effluent discharge criteria limits provided in Table 3-1 of this QAPP. Any exception to this must be clearly documented with an explanation of how the data will be evaluated in this case.

7.1 Air Monitoring Samples for Particulates

Air monitoring at the property fence line for particulates will be performed to evaluate the Contractors dust control procedures. This monitoring will be performed as described in Section 01101 of the specification, the Health and Safety Plan and Section 4.2 of the CQAP. The SOP for this procedure shall be included by the Contractor in this QAPP.

7.2 Screening Level Soil Sampling

In order to determine the limits of excavation or the contaminant source soils, a field screening level analysis will be performed on composite soil samples from each sidewall and the floor of the excavation. The indictor parameter for this analysis will be 1,1,1-TCA. The analysis selected must be capable of achieving a detection limit of 9 mg/kg for this compound. A field test kit or field Gas Chromatograph are possible

methods to be used for analysis. The Contractor shall include the SOP for the selected field screening testing procedure in this QAPP.

7.3 Confirmatory Soil Sampling

At the limits of excavation, composite soil samples will be collected from each sidewall and the floor of the excavation for analysis for VOCs. Additionally, periodically during treatment of the excavated soils by LTTD, composite soil samples will be collected and analyzed for VOCs. The Contractor must provide the relevant SOPs for the method selected for this analysis. Because the analytical data will be used to verify compliance with remediation goals the analytical method selected must be capable of achieving reporting limits below the soil remediation goals levels for the contaminants of concern in Table 3-1.

7.4 Influent and Effluent Sampling

The influent to and effluent from the on-site air stripper will be sampled and analyzed for VOCs during this project. Samples will be collected during excavation for dewatering purposes and then collected over a longer term from the leachate control system to be installed at the site. The influent and effluent concentrations will be compared to determine effectiveness of the air stripper. The effluent concentrations will be compared to the discharge criteria provided in Table 3-1. The analytical method selected for influent and effluent analysis must be capable of achieving reporting limits below the discharge criteria limits to allow for a determination of compliance. The Contractor must provide the relevant SOPs for the method selected for this analysis.

7.5 Groundwater Sampling

Groundwater monitoring wells will be installed for this project and will be tested quarterly over a two year period to evaluate the effectiveness of the leachate control system and soil removal. The groundwater samples will be analyzed for VOCs and the result compared to the groundwater remediation goals shown in Table 3-1. The analytical method selected for groundwater analysis must be capable of achieving reporting limits below the groundwater remediation goal limits to allow for a determination of compliance. The Contractor must provide the relevant SOPs for the method selected for this analysis.

Section 8
Quality Control Requirements

Quality control (QC) must be maintained throughout remedial action activities. QC is the overall system of technical activities that measure the performance of these remedial action activities against the standards as defined in this QAPP, the CQAP, the PSVP and the plans and specifications.

8.1 Field Sampling Quality Control

During sample collection, QC samples shall be obtained by the Contractor. QC samples include field duplicate samples, trip blanks, equipment blanks, field blanks, and matrix spike/matrix spike duplicate (MS/MSD) samples. The Contractor must provide a table specifying the frequency of each field QC sample type to be collected by matrix and analyte group. Additionally procedures for QC sample collection either in text or in the form of SOPs must be provided. This information should be detailed in the SAP and referenced in this section of the QAPP.

QC procedures for field measurements are limited to checking the reproducibility of the measurement by obtaining multiple readings and/or by calibrating the instruments (where appropriate). When any field instrument fails the QC checks for calibration it will be recalibrated, repaired, or replaced, whichever is necessary. QC of field sampling will involve collecting field duplicates and blanks in accordance with the applicable procedures described in the SAP.

Measurement data will be generated in many field activities that are incidental to collecting samples for analytical testing or unrelated to sampling. These activities include, but are not limited to, the following:

- Documenting time and weather conditions;
- Locating and determining the evaluation of sampling stations;
- Determining pH and temperature of water supply;
- Determining depths in a borehole; and
- Ambient air monitoring.

The general QC objective for such measurement data is to obtain reproducible and comparable measurements to a degree of accuracy consistent with the intended use of the data through the documented use of standardized procedures. The procedures for performing these activities and the standardized formats for documenting them must be prepared by the Contractor and presented in the SAP.

8.2 Analytical Quality Control Checks

This subsection must document the QC procedures, checks, samples , and acceptance limits that will be used during the project to monitor the quality of the analytical methods. This information should be provided by the analytical laboratory(ies) selected to perform the analytical portion of this project. The Contractor may reference the appropriate sections of the laboratories' QA manual or SOPs as appropriate. These referenced documents must be attached to this QAPP. The Contractor must ensure that the methods chosen for analysis have QC acceptance limits that support the collection of usable data. The chosen laboratory must be able to meet the project required QC limits

Section 9
Instrument/Equipment Calibration and Maintenance

The Contractor must supply a complete list of field equipment to be used for this project. A partial list is assumed to include a photoionization detector (PID), field pH/conductity/temperature meter, turbidimeter, and submersible pump with controller. The Contractor is responsible for obtaining a complete list of all laboratory equipment to be used for this project and referencing this list in this QAPP section.

9.1 Field Instrument Calibration & Frequency

At a minimum, field instruments that require calibration include the PID meter (The model to be used must be specified), pH/Conductivity/Temperature multiparameter meter (specify model), and the turbidimeter (specify model). This is not a complete list and the Contractor is expected to update this information prior to data gathering activities. The Contractor must provide a schedule for calibration of the field instruments to be used for this project. Calibration information should be provided and kept with the field instrument. This information will be entered into the field book on the first day of sample collection. If erratic readings are noted from a field instrument, or if the instrument appears to be damaged or altered during daily inspections, the instrument will be calibrated in accordance with the manufacturer's instructions. Copies of these manufacturer's instructions should be provided in the SAP.

Based on typical models of these field instruments the sensitivity of each Field Instrument is as follows:

- PID Meter - Range 0-2000 ppm, Resolution 0.1 ppm
- Multiparameter Meter (pH probe)- Range 0-14 units, Resolution 0.01 units, Accuracy ±0.01 units.
- Multiparameter Meter (Temperature probe)- Range -5 to 45 °C, Resolution 0.01 °C, Accuracy ±0.15 °C.
- Multiparameter Meter (Conductivity probe)- Range 0 to 100 mS/cm, Resolution 0.001 mS/cm (low range) to 0.1 mS/cm (high range), Accuracy ±0.5% of reading +0.001 mS/cm.
- Turbidimeter- Range 0-1000 NTU, Resolution 0.01 NTU (0-9.99 NTU range) , 0.1 NTU (10-99.9 NTU range), 1 NTU(100-999.9 NTU range), Accuracy ±2% of reading plus stray light.

This information must be updated by the Contractor for the specific instruments and models to be used for this project. The sensitivity required for this project is not greater than that specified for each instrument listed above.

9.2 Laboratory Instrument Calibration & Frequency

This subsection must document the calibration procedures and frequency for all laboratory instruments to be used for this project. This information is laboratory specific and the Contractor is responsible for obtaining and documenting these procedures either in the form of analytical SOPs or by referencing appropriate sections of the laboratory QA manual. Items that must be addressed include but are not limited to frequency of initial and continuing calibration, number of calibration points, linearity calculation techniques, acceptance criteria for calibration, corrective action, and calibration standards documentation.

9.3 Field Instrument Maintenance

The field equipment to be used for this project includes at a minimum, a photoionization detector (PID), field pH/conductivity/temperature meter, turbidimeter, and submersible pump with controller. The Contractor is responsible for preparing a Preventive Maintenance schedule for the equipment to be used. The Contractor will be responsible for implementing these procedures and documenting the procedures carried out in the field logbook and including this information in the daily reports as specified in Section 6.3.1 of the CQAP.

9.4 Laboratory Instrument Maintenance

The Contractor must obtain and document in this subsection the schedule for maintenance for each instrument to be used during this project for each laboratory to be used for this project . It is preferred that this information be presented in tabular format, however it may be presented in the format the laboratory provides. Instrument manufacturer's specifications are not acceptable to fulfill this requirement.

Section 10
Data Management, Validation and Usability

10.1 Data Management

The Contractor must provide the procedures to be used to address each of the following data management steps for this project. This may be accomplished by referencing appropriate SOPs, laboratory QA manuals, the SAP, the CQAP or providing text in this section. The Contractor may refer to the USEPA Region V Instructions on the Preparation of a Superfund Division QAPP, Element B10 for more detailed information. The data management steps that must be addressed as appropriate to the project include:

- Data recording
- Data Validation
- Data transformation/Data reduction
- Data Transmittal
- Data Analysis
- Data Assessment
- Data Tracking
- Data storage and retrieval
- Data security

10.2 Data Verification/Validation

The Contractor will be responsible for identifying a third party to validate data submitted by analytical laboratories that is used to verify cleanup. Data validation is not required for any data generated by the particulate air monitoring, the field GC or field test kit unless field audits indicate significant non-compliance issues during sample collection and analysis. The analytical data from the field testing of soil for volatile organics will be evaluated for accuracy, precision and completeness in the field. The data will be assessed by reviewing field and laboratory duplicates and blanks.

All data validation shall be performed using the USEPA CLP NFG for Organic Data Review (USEPA, October 1999) s a guideline. The Contractor may submit an alternate guideline for data validation which will be subject to Illinois EPA review and approval. A data validation checklist shall be provided in this section.

Data validation consists of examining the sample data package(s) against pre-determined standardized requirements. The validator may examine, as appropriate, the reported results, QC summaries, case narratives, COC information, raw data, LCS/LCSDs, MS/MSDs, initial and continuing instrument calibration, and other reported information to determine the accuracy and completeness of the data package. During this process, the validator will verify that the analytical methodology were followed and QC requirements were met. The validator may recalculate selected analytical results to verify the accuracy of the reported information. Analytical results will then be qualified as necessary.

Verification of field results, including PID, field GC, and/or test kits includes checking that results from field log books have been correctly transferred to data reports as well as checking to ensure all deviations from the approved sampling and analysis procedures are well documented.

The Contractor shall also describe any deviations from the planned sampling design, sample collection procedures, or sample handling procedures.

Data validation for critical cleanup verification samples must be performed on a fast turnaround basis so as not to delay the project activities. The Contractor shall provide a detailed schedule for data validation of cleanup verification and system performance evaluation samples which will be subject to Illinois EPA approval.

10.3 Data Usability

Nondirect measurement data include information from a preliminary assessment and previous sampling events. The acceptance criteria for such data include a review by someone other than the author. Previous data that may be used for this project include soil characteristics information, historical groundwater data, historical soil data and historical soil gas data. These data sets were gathered under an approved QAPP for site characterization under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). All historical soil and groundwater samples were analyzed by the CLP program. All these data sets were validated by USEPA Region V. The Contractor should list in this section any previous data , by source, intended for use in this project..

Once new data has been generated, The Contractor shall evaluate the analytical data for the PARCC parameters as stated in Section 3 of this QAPP. Data for this project will be used to verify clean up and to evaluate remediation system performance. Estimated data will be considered usable for all calculations. Sample data will be maintained by the contractor as specified in Section 6.0 of the CQAP and in the plans and specifications.. Laboratory QC sample data will be stored in hardcopy and in a separate database.

Section 11
Assessment and Oversight

The Contractor must identify the number, frequency and type of planned internal assessment (audits) for this project. The person(s) responsible for performance of these audits shall be identified in this section. Potential types of assessments that may be performed include:

- Field Sampling Technical System Audit
- Field Analytical Technical System audit
- Performance Evaluation sample tracking and analysis
- Data package Technical Performance Audit

The Contractor must also provide a description of how any project deficiencies identified through the audit process will be handled. The sequence of corrective action activities shall be listed in this section. The Contractor may refer to the

USEPA Region V Instructions on the Preparation of a Superfund Division QAPP, Element C1 for more detailed information.

The Contractor shall include the results of all audits in QA reports to be provided to IEPA and their Representative. Field staff will note any quality problems on field data sheets. The Contractor will inform Illinois EPA's Representative upon encountering any quality issues that cannot be immediately corrected. The QA reports will contain but are not limited to:

- project status
- results of performance and systems audits
- data quality assessments
- quality assurance problems with proposed corrective actions
- QAPP amendments
- project meeting minutes
- any unresolved problems
- assessment of data deficiencies
- any other significant QA/QC problems not included above.

These reports should conform to the documentation requirements described in Section 6.0 of the CQAP.

Appendix B

Illinois Environmental Protection Agency

Sampling and Analysis Plan
Source Area 4 Remedial Design
Southeast Rockford Groundwater Contamination Site

September 13, 2004

Draft Final Appendix B

Contents

Section 1
Introduction

The Draft Final Remedial Design (RD) Sampling and Analysis Plan (SAP) describes sample collection procedures and monitoring procedures that will be performed for remedial action. This Draft Final RD SAP for the Southeast Rockford Superfund Site will be submitted as part of the "Pre-Final" design package to the Illinois Environmental Protection Agency (IEPA), as specified in the Southeast Rockford Superfund Site Remedial Design Work Plan, prepared by Camp Dresser & McKee (CDM).

The Draft Final RD SAP has been developed following incorporation of the Illinois EPA and USEPA comments on the "Intermediate" design. The Final RD SAP will be prepared by the Contractor and submitted with the Final Design package to the IEPA. The Final RD SAP will serve as a supplement to the Final RD Quality Assurance Project Plan (QAPP).

The Record of Decision (ROD) for the Southeast Rockford Superfund site was signed by the Region V Administrator of the United States Environmental Protection Agency (U.S. EPA), on June 11, 2002. Under contract to the Illinois EPA, the Contractor will follow the ROD, the approved Statement of Work (SOW), and the approved Remedial Design (RD) for remedial action at Area 4 for the site. Southeast Rockford Groundwater Contamination Superfund Site is identified by the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) identification number of ILD981000417.

1.1 Objectives of Sampling Program

This Sampling and Analysis Plan (SAP) shall describe the data gathering activities required for the Southeast Rockford Groundwater Source Area 4 Remedial Action (Area 4 RA) Pre-Design Field Study. The objectives of the sampling program are as follows:

- Provide real-time air monitoring for VOCs and particulates for health and safety purposes and to evaluate the dust and vapor control measures employed during intrusive activities and LTTD operation.

- Monitor soil concentrations for indicator VOCs during the excavation process to determine the limits of excavation.

- Provide confirmatory laboratory data for VOCs for the soils remaining in place at the limits of excavation.

- Provide sampling and analysis of the influent and effluent to the air stripper during dewatering to evaluate air stripper efficiency.
- Provide long-term effluent data for the VOCs of concern to evaluate compliance with the effluent discharge requirements.
- Provide confirmatory soil sampling and analysis for VOCs for the treated soils to determine compliance with the soil remediation goals prior to their use as backfill to the excavation.
- Provide long-term groundwater data for VOCs for comparison to the groundwater remediation goals to evaluate the effectiveness of the source removal and leachate control system.

1.2 Sampling Team Responsibilities

Field sampling will be performed by the Contractor. The project organization chart is shown in Section 2 of the Remedial Action QAPP as provided by the Contractor. Responsibilities of the sampling team are described below. These may be modified as appropriate by the Contractor.

Field Manager

The Field Manager (FM) will be responsible for assigning the sampling team responsibilities (in conjunction with the Site Manager), as well as overseeing all field activities. The FM will coordinate mobilization and demobilization for the sampling team, as well as for any subcontractors. The FM will be responsible for keeping the Site Manager up to date on all sampling and subcontractor activities.

Sampling Team Leader

The Sampling Team Leader (STL) will be responsible for the sampling efforts, will assure the availability and maintenance of all sampling equipment and materials, and will maintain an adequate supply of shipping and packing materials. The STL will supervise the completion of all chain-of-custody records, the proper handling and shipping of the samples collected, be responsible for the accurate completion of field log books, and provide close coordination with the Field Data Coordinator (FDC) and the FM. The STL or FM will be present whenever samples are collected.

Sampling Team Member(s)

The Sampling Team Member(s) (STM) will perform field measurements, collect samples, prepare samples for shipping, and decontaminate sampling equipment as directed by the STL.

Field Data Coordinator

The Field Data Coordinator (FDC) will remain in the support area and will accept custody of samples from the sampling team. The FDC will be responsible for the completion of all chain-of-custody and sample traffic control forms. The FDC will also be responsible for maintaining communications with on-site personnel and off-site laboratory personnel, as well as for logging all communications and site entries and departures.

Site Health and Safety Coordinator (SHSC)

The SHSC is responsible for daily supervision and documentation of all safety, decontamination, environmental monitoring and field medical monitoring activities. The SHSC is responsible for assuring that all field personnel comply with the provisions of the Contractor Health and Safety Assurance Manual and site Health and Safety Plan (HSAM/HSP). The SHSC has the authority to suspend site work if conditions become unsafe, if HSAM/HSP requirements are not met, or if he/she determines that an upgraded level of protection may be required. The SHSC is responsible for designating and marking restricted areas during various site activities and for redesignating these areas when it is appropriate to do so.

Safety Technician

The Safety Technician (a designated member of the sampling team) will assist with sampling, aid other sampling team members with the donning and doffing of protective clothing, decontamination of sample containers and equipment, and will be available to replenish miscellaneous supplies, such as ice and vermiculite, as needed. The Safety Technician will report directly to the SHSC in health and safety related duties and will assume the responsibilities of the SHSC in the event of his/her absence from the site or in an emergency.

1.3 Scope of Sampling Activities

The scope of sampling activities detailed by this plan includes various phases of collection and analysis that will be performed during this investigation. It is the responsibility of the Contractor to define the scope based on the requirements in the specifications Sections 01101, 01110, 02113, 02141, and 02675.

The Contractor shall provide a table, which summarizes the sampling and analysis program. This table shall include the sample matrix, field parameters, laboratory parameters, number of investigative samples by matrix, number of field duplicates by matrix, number of field blanks by matrix, and total number of samples for each matrix.

It is acknowledged that the number of samples collected during the Area 4 Remedial Action will depend on the progress and results of remediation activities; as a result,

the actual numbers of borings and samples installed or collected will likely vary somewhat from those given in this SAP and QAPP.

Section 2
Project Description

2.1 Area 4 Remedial Action

Area 4 is situated in a mixed industrial, commercial, and residential area of Rockford, Illinois located east of Marshall Street and south of Harrison Avenue. The location of Area 4 is shown on **Figure 2-1**. Area 4 is comprised of a building and associated parking lot that housed a former machine shop (Swebco Manufacturing, Inc.) located at 2630 Marshall Street. Currently, the building is occupied by a wood pallet manufacturing and refurbishing operation. A residential trailer park (Barrett's) is located adjacent to Area 4 to the northeast.

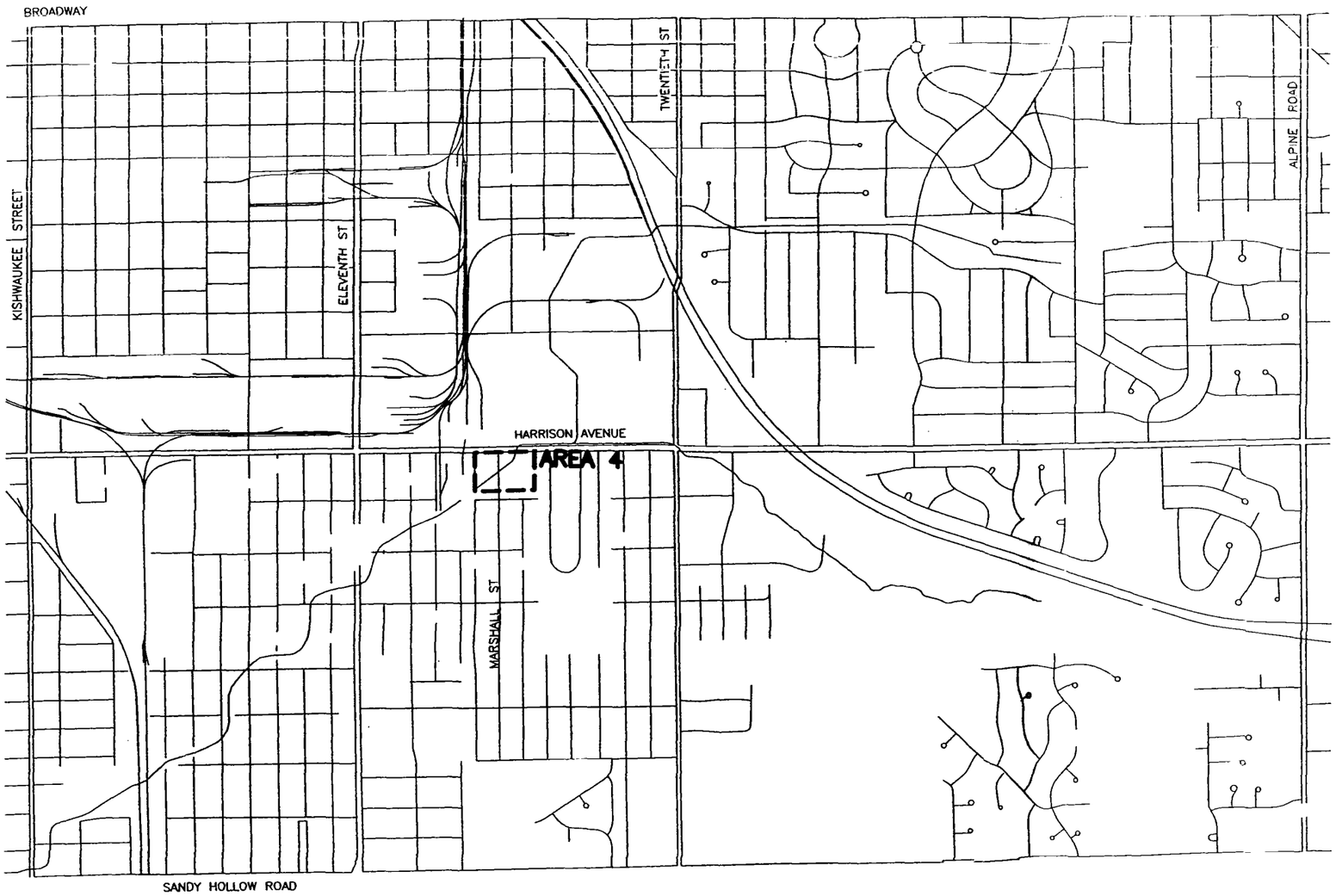
In 1981, the City of Rockford discovered groundwater contamination at the property that became the Southeast Rockford Superfund site. In 1981 to 1997, the Illinois EPA and the Illinois Department of Public Health (IDPH) performed investigations at the site that revealed that volatile organic compound (VOC) contaminants were present in the groundwater, soil, and soil gas. During this and other investigations, the following contaminants of concern have been identified: 1,1-dichloroethene (1,1-DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloroethane (1,1,2-TCA), trichloroethene (TCE), tetrachloroethene (PCE), and carbon tetrachloride (carbon tet) .

Chlorinated solvents are the principle contaminants present at the site. Contaminants were released to the environment from storage tanks or improper disposal practices. Soil contamination, including visible staining and free product, exists from approximately 25 to 37 feet below ground surface (bgs) in the east and west portion of the excavation area, and from just below the surface to 37 feet bgs in the central portion of the excavation where waste was thought to have been placed on the ground. Groundwater samples collected from the aquifer in the overburden soil revealed that chlorinated solvent contamination was present in the groundwater. Groundwater is encountered at approximately 30 feet bgs.

The subsurface in this area primarily consists of medium-grained sand to a depth of approximately 30 feet below ground surface (bgs) overlain by silty topsoil (approximate 5 feet) in most areas. Groundwater in the unconsolidated sediments beneath Area 4 flows in a west-northwesterly direction.

Based on remedial investigations and site-specific risk assessment, Remedial Action Objectives (RAOs) were developed. The Area 4 RAOs provide a general description of what the remedial action will accomplish and are as follows:

- Prevent the public from ingestion of soil, and direct contact with soil containing contamination in excess of state or federal standards or that poses a threat to human health



LEGEND:

N

SCALE:
500 0 1000 Feet

Figure 2-1
Southeast Rockford Area 4 Remedial Design
STUDY AREA 4

CDM

RomanO
8:23:30
08/03/04 09:56:20
FIG2-1
S:\1681\Area 4 RD\

- Prevent the public from inhalation of airborne contaminants in excess of state or federal standards or that pose a threat to human health

- Prevent the further migration of contamination from Area 4 that would result in degradation of site-wide groundwater or surface water to levels in excess of state or federal standards, or that pose a threat to human health or the environment

A number of potential remedial action alternatives for Area 4 were developed and evaluated based on RAOs, remediation goals and comparative evaluation criteria. The detailed comparative analysis of Area 4 remedial alternatives is discussed in detail in the Record of Decision (ROD). Based on the comparative analysis, the remedy selected for Area 4 includes institutional controls, soil excavation with on-site low-temperature thermal desorption, and leachate containment and treatment.

Remedial action will be implemented at the site in Area 4 to remove the source of chlorinated solvent contamination. Remedial action will consist of soil excavation, treatment of contaminated soil, and leachate containment and treatment of the affected area (Area 4) to address the soil and groundwater contamination. Contaminated soil will be excavated and treated by low temperature thermal desorbtion (LTTD) then returned as backfill to the soil excavation. Uncontaminated overburden, where it exists, will be stockpiled and returned to the excavation. Dewatering of the soil excavation will occur during excavation activities. Temporary wells will be installed in the vicinity of soil excavation for dewatering. Contaminated groundwater from dewatering will be pumped to an onsite air stripper unit for treatment and subsequently, effluent water will be discharged to the concrete-lined drainage ditch immediately north of the site.

Following completion of the soil excavation and LTTD treatment activities, monitoring wells will be installed in the vicinity of the soil excavation to obtain groundwater samples for laboratory analysis to monitor contaminants in the groundwater following remedial action.

Finally, extraction wells will be installed downgradient of the excavation for long-term hydraulic containment of leachate. Extracted leachate will be pumped to an onsite air stripper unit for treatment and subsequently, effluent water will be discharged to the concrete-lined drainage ditch immediately north of the site.

Section 3
General Sampling Information

In this section, the Contractor must document the procedures to be used for collection, preservation, documentation, and shipping of samples analyzed by on-site or off-site laboratories. It is recommended that these procedures be carried out in accordance with *Contract Laboratory Guidance for Field Samplers* (OSWER 9240.0-035, EPA 540-R-00-003). Site-specific sampling information shall be included in the following sections. However, the sampling procedures will follow all applicable guidelines in the field sampling guidance and are not limited to the information provided in Section 3.

3.1 Sample Containers and Preservation

All soil and groundwater samples will be collected in laboratory-decontaminated sample bottles and jars provided by the Contractor. The source for sample bottles and preservatives must be specified by the Contractor in this section. Containers for samples that require preservative may be pre-preserved by the manufacturer. At soil boring locations and groundwater sampling locations, concentrations of contaminants are anticipated to be either low or medium concentrations as designated by the USEPA CLP. Sampling, handling and shipping of the samples will be performed in accordance with these anticipated concentrations.

A summary of soil and water sample containers, their size and construction material, and sample matrix and holding times shall be provided in this section by the Contractor. Internal laboratory QC requirements for analytical samples are discussed in Section 7 and in the RD QAPP Section 8.

3.2 Sample Holding Times

The Contractor must specify how samples will be transported to the respective laboratory so as not to compromise the holding time requirements.

3.3 Sample Packaging and Shipment

Following sampling, the sample bottle exteriors will be decontaminated near the sampling location, or rinsed with potable or distilled water prior to shipment. The Field Manager will help the Field Data Coordinator prepare documentation and package sample bottles for shipment according to the following procedures:

- Check for proper sample preservation; tighten sample bottle caps securely and seal with tape; mark liquid levels if bottles are partially full.
- Make sure sample labels/tags are securely attached to the sample container; place each container in a zip-loc baggie, ensuring that labels can be read.

- Place containers in a cooler lined with two inches of perlite or equivalent absorbent material; maintain at 4°C with cold packs or ice sealed in plastic bags; fill remaining space in cooler with additional packing material.

- Place completed chain-of-custody forms and any other required shipping forms reports in a zip-loc baggie and tape to inside of cooler lid.

- Close cooler and seal with strapping tape; if cooler has a drain port, seal it with tape; place one custody seal across closure at front of cooler and across hinge area at back of cooler, or rear side corner.

- Affix airbill with shipper's and consignee's addresses to top of cooler; place "This End Up" labels appropriately. Restricted article airbills will be used in shipping medium and high-concentration samples.

Collected and packaged samples will then be shipped to the designated laboratory. The Contractor shall provide examples of all sample labeling and shipping forms to be used for this project as appendices to this SAP and reference them in this section.

3.4 Chain-of-Custody Procedures

Chain-of-custody will be maintained throughout the sample preparation procedure as described in Section 6 of the RD QAPP. Preparation of sample labels/tags, COC preparation, and sample packaging/shipping procedures for samples will be performed in accordance with the USEPA document *Contract Laboratory Guidance for Field Samplers* (OSWER 9240.0-035, EPA 540-R-00-003). The Contractor may follow alternate guidance for COC if approved by Illinois EPA and Illinois EPA's Representative prior to finalization of this SAP.

3.5 Documentation

This section outlines the minimum documentation required for all field activities, sample collection, handling and shipment to be conducted during the Area 4 Remedial Action. This section shall be finalized by the Contractor to comply with the requirements of the CQAP Section 6.0 and Contractor specific procedures.

3.5.1 Field Log Books

Field log books will provide the means of recording pertinent data collected during the performance of data gathering activities. As such, entries will be described in as much detail as possible so that site personnel can reconstruct a particular situation without reliance on memory.

Field log books will be bound, field survey books. Log books will be assigned to field personnel, but will be stored in the document control center when not in use. Each log book will be identified by the project-specific document number.

The title page of each notebook will contain:

- Person or Organization to whom the book is assigned;
- Book Number;
- Project Name;
- Start Date; and
- End Date.

Entries into the log book will contain a variety of information. At the beginning of each entry, the date, start time, weather, name of all team members present, level of personal protection being used, and the signature of the person making the entry will be recorded. The names of visitors to the site, field sampling or investigation team personnel and the purpose of their visit will be recorded in the field log book. At the end of each day's activity, the log will be closed with the time and signature of the person making the last entry (log-closed line). The log-closed lines and the following log-open lines will be placed so that no unauthorized entries can be made between entries.

Measurements made and samples collected will be recorded. All entries will be made in ink and no erasures will be made. If an incorrect entry is made, the information will be crossed out with a single strike mark. Wherever a sample is collected or a measurement is made, a detailed description of the location of the station, which may include compass and distance measurements, shall be recorded. The number of the photographs taken of the station with a brief description including and the direction faced will be noted. All equipment used to make measurements will be identified, along with the date of calibration.

The equipment used to collect samples will be noted, along with the time of sampling, sample description, depth at which the sample was collected, volume and number of containers. Sample location identifiers will be assigned prior to sample collection. Duplicates, which will receive a separate sample number, will be noted under sample description.

3.5.2 Sample Identification System

The Contractor is responsible for documenting the sample numbering system to be used for this project. The criteria that must be met for any system used is that each sample has a unique identifier and that the sample information is easily retrievable by sample identifier.

Sample designations will be recorded in the sample field book, on the chain-of-custody forms, the traffic reports, the sample identification record form, and on the sample tags affixed to the sample jars.

3.6 Sample Documentation Forms

The Contractor shall provide a description of all sample documentation forms and their use in this section. Examples of all forms shall be provided in an appendix to this SAP.

A) Chain-of-Custody Form

1) One form per shipping container (cooler) will be used.

2) Carrier service will not need to sign form if custody seals remain intact.

3) Will be used for all samples.

B) Chain-of-Custody Seals

1) Two seals per shipping container will be used to secure the lid and provide evidence that samples have not been tampered with.

2) Seals will be covered with clear tape.

3) Seal numbers will be recorded on Chain-of-Custody Form.

4) Seals will be used for all sample shipping containers.

5) The STL or FM will sign and date each custody seal.

C) Sample Tags

1) A sample container from each sampling location will have a Sample Tag affixed to it with string or wire.

2) The station name, station location, date, time, analysis required, preservative, and type of sample (grab/composite) will be recorded on the sample tag.

3) The sample number will be entered on the sample tag, and will be cross-referenced with the sample labels.

4) Sample Tag Numbers will be recorded on Chain-of-Custody Forms.

The COC will be sealed in a plastic bag that is taped to the inside of the cooler lid. Copies of the COC will be retained for the field files.

The sample handling technician will maintain lists cross-referencing site sample numbers, custody tag number, analyses to be performed, custody seal number, shippers' airbill numbers, and consigned laboratories in a bound log book using black ink.

Section 4
Sampling Locations and Rationale

In this section the Contractor must provide a detailed description of all sampling required by the plans and specifications, describe the sample locations for sampling and the purpose of the sampling. This includes the installation of all leachate extraction and monitoring wells. The following provides the basic information for this section which will require finalization by the Contractor and inclusion of specific items as required by the specifications.

Sampling of various media and field and laboratory analysis for VOCs will be required per the design specifications. The analytical data to be used to verify cleanup will be compared to the remediation goals set forth in the ROD. As such, this data must be of sufficient quality to ensure that the remediation goals have been met. This QAPP/SAP is designed to ensure that the data collected for this purpose are of sufficient quality to meet that objective.

During excavation of the contaminated soils, soil samples will be collected from the estimated limits of the excavation and tested in the field to determine if excavation is complete. Confirmatory soil samples will be collected from the final limits of the excavation and sent for laboratory analysis to determine what contamination if any is left in place. This work is described in Section 02113 of the specifications.

The excavated, treated soils will undergo composite sampling and analysis for VOCs. Section 13713 provides details regarding the requirements for this sampling. These sample results will be compared to the soil remediation goals before being used as fill. Any treated soils exceeding the goals will be retreated and re-tested prior to being used as fill.

During excavation, dewatering of the excavation will occur. This water will be sampled before it is treated by the air stripper and after it is treated by the air stripper. The influent and effluent results will be compared to determine stripper effectiveness and the effluent will be compared to the effluent discharge requirements before being discharged to the drainage ditch. After completion of the excavation, the air stripper will continue to receive leachate from the Area 4 source area leachate extraction wells. Section 02675 of the specification provides the details for these wells. This effluent will be monitored over a period of two years for VOCs and the results compared to the effluent discharge criteria. Section 13905 provides details regarding the criteria for sampling.

Monitoring wells will be installed with in Area 4 and downgradient from the leachate control system in Area 4 to monitor the condition of the groundwater and the effectiveness of the leachate control system. Details for these wells is provided in

Section 02141 of the specifications. The data from the monitoring wells will be compared to the groundwater remediation goals.

Section 5
Sampling Equipment and Procedures

This section shall describe in detail the sampling procedures and equipment to be used for all the sampling activities described in Section 4 of this SAP. The Contractor may attach sampling SOPs if applicable to the sampling required and reference them in this section. It is recommended that a complete list of all field equipment, both sampling and monitoring be attached to this SAP. The objective is that the procedures to be used for all sampling for the remedial action be documented and readily available to the field personnel responsible for conducting the sampling.

Section 6
Decontamination Procedures

Procedures to be followed to decontaminate equipment and personnel shall fully describe in the Area 4 RD Health and Safety Plan (HASP). This section shall be updated by the Contractor prior to finalization of this SAP. Some general decontamination procedures are summarized below. The Contractor must supply the specific procedures to be used for this project in this section of the SAP.

6.1 Personnel Decontamination

Personnel decontamination stations will be set up at the edge of each work area. Personnel will become thoroughly familiar with the decontamination procedure before work begins in exclusion zones. The exclusion zone will be defined as an area 25 feet surrounding the excavation or sample collection points. The decontamination procedure is as follows:

- Place equipment and/or samples in segregated equipment drop-areas.
- Remove disposable outer booties (when used).
- Remove chemical resistant outer gloves.
- Remove hard hat, goggles/safety glasses/face shield.
- Remove inner disposable gloves.
- Wash hands and face with water and hand soap.

6.2 Equipment Decontamination

All sampling equipment will be decontaminated prior to use. Between samples, all parts of the sampler will be decontaminated. Sampling equipment will be decontaminated by scrubbing the equipment in a low-sudsing detergent solution, rinsing the equipment in tap water, and air drying the equipment.

All reusable non-dedicated equipment (scoops, buckets, core samplers, dredges, bottle sampler) will be decontaminated between samples, and before removal from the site. The procedure is given in **Table 6-1**.

6.3 Sample Bottle Decontamination

Sample bottles for shipment to the laboratories will be decontaminated by immersing the bottle up to the neck in soap (Alconox or equivalent) and water solution and then

rinsing with potable or distilled water. Solvents will not be used to wash sample bottles.

Table 6-1
Standard Decontamination Protocol for Sampling Equipment

STEP 1:	Scrub equipment thoroughly with soft-bristled brushes in a low-sudsing detergent solution.
STEP 2:	Rinse equipment with tap water by submerging and/or spraying.
STEP 3:	Rinse equipment with distilled water by spraying until dripping.
STEP 4:	Place equipment on plastic or aluminum foil and allow to air dry for five to ten minutes.
STEP 5:	Wrap equipment in plastic or aluminum foil for handling and/or storage until next use.

NOTE: In order to avoid analytical problems caused by solvent use in decontamination, solvents will not be used for decontamination. Only distilled water shall be used for rinsing equipment. An exception will be made if upon visual observation or high organic vapor readings it is determined that a zone of highly contaminated material is encountered. In such an event, isopropyl alcohol will be used before step 1 above.

6.4 Storage and Disposal of Investigation-Generated Wastes

The sampling activities are expected to generate solid and liquid "waste." Investigative-Derived Waste (IDW) such as gloves, overboots, disposable sampling equipment, etc. may also be generated during sampling activities. The Contractor must develop a plan for the handling of the wastes.

Section 7
Field Quality Control Procedures

To ensure the level of data quality required for the Area 4 RD sampling events, the following Quality Control (QC) procedures will be performed. Draft QC sample requirements are summarized in **Table 1-1**. This information is provided in draft and shall be updated by the Contractor based on requirements in the final specifications, the PVS plan and the CQAP.

7.1 Soil and Water QC Samples

7.1.1 Field Duplicates

Duplicate samples will be collected as follows:

- One duplicate soil sample for every 10 samples (or portion thereof) collected in the field.
- One duplicate water sample for every 10 samples (or portion thereof) collected in the field.

7.1.2 Field Blanks

One field blank water sample will be prepared for every ten water samples collected. Field blanks will be prepared by filling water sample bottles with reagent-grade distilled water from the sampling device (if possible), at the same volume as the water samples. Sample bottles for all parameters will be prepared. These samples will be prepared in close proximity to an actual sample location. This location will be recorded in the sample field log book.

7.1.3 Trip Blanks

A trip blank for volatile organic analysis (VOA) will be included in each sample shipment that includes liquids for volatile organic analysis. The trip blank will consist of four 40-ml VOA vials filled with reagent-grade distilled water. The trip blank will be prepared in the office or laboratory, transported to the field, and shipped with the other samples to the laboratory without being opened. The trip blank will be documented on a COC form for shipment to the designated laboratory.

7.1.4 Rinsate Blanks

One rinsate blank for soil sampling equipment will be collected at the end of each day of sampling. Rinsate blanks will be prepared by pouring laboratory grade distilled/deionized water over the decontaminated non-dedicated geoprobe sampling equipment, and then collecting the water in the sample containers. The sample containers and sample volume will be the same as a water sample or field blank. The

FM or STL will record the sample location that preceded collection of the rinsate blank in the field log book.

7.1.5 Matrix Spike and Matrix Spike Duplicates

All samples designated as MS/MSD samples will be collected as specified by the laboratory for the project and in the USEPA Region V Sample Handling Manual. Matrix spike samples will be denoted by the sample number followed by an -MSD suffix on sample tags and COC forms.

Soil samples collected for VOC MS/MSD analysis will be collected at double volume at a frequency of one per 20 samples. Water samples will be designated for MS/MSD analysis at a frequency of one per 20 samples. Double sample volume is required for both soil and Water volatile samples. MS/MSD samples will be selected from areas where contamination is known or suspected, if possible.

Appendix C

Illinois Environmental Protection Agency

Health and Safety Plan
Source Area 4 Remedial Design
Southeast Rockford Groundwater Contamination Site

September 13, 2004

Draft Final Appendix C

HEALTH AND SAFETY PLAN FORM CDM Health and Safety Program	*This document is for the exclusive use of CDM and its subcontractors*	CAMP DRESSER & McKEE INC. PROJECT DOCUMENT #:

PROJECT NAME	Southeast Rockford Superfund Site: Remedial Design	PROJECT #	1681-38601	REGION	Central
JOBSITE ADDRESS	11th Street to Alpine Road (West to East) Harrison Avenue to Sawyer Road Ext. (North to South) Rockford, Illinois	CLIENT	Illinois Environmental Protection Agency		
		CLIENT CONTACT(s)	Tom Williams		
		CLIENT CONTACT PHONE #(s)	(815) 223-1714		

( ) AMENDMENT TO EXISTING APPROVED H&SP?
( ) H&SP AMENDMENT NUMBER? _____ ( ) DATE EXISTING APPROVED H&SP _____

OBJECTIVES OF FIELD WORK:

For remedial design, soil excavation of contaminated soil will be performed for remedial action, relating to 1,1,1-trichloroethane (TCA) contamination from a former underground storage tank (UST). Following excavation, soil will be treated by low temperature thermal desorption (LTTD) and returned to the excavation as backfill material. Soil samples of the LTTD-treated soil will be collected for analysis, prior to placing treated soil back into the excavation. Subsequently, monitoring wells will be installed and groundwater sample collection will be conducted, to determine the presence of TCA in the groundwater.

TYPE: *Check as many as applicable*

Active	(x)	Landfill (on-site)	( )	Unknown	( )
Inactive	( )	Uncontrolled	( )	Military	( )
Secure	( )	Industrial	(x)	Other (specify): Along	( )
Unsecure	( )	Recovery	( )		
Enclosed space	( )	Well Field	( )		

All requirements described in the CDM Health & Safety Assurance Manual for Hazardous Waste Operations are incorporated in this Health and Safety Plan by reference.

DESCRIPTION AND FEATURES: *(Include principal operations and unusual features (containers, buildings, dikes, power lines, hills, slopes, rivers, etc.)*

Soil excavation and groundwater sampling will be conducted at Area 4 of Operable Unit 3 at the Southeast Rockford Superfund Site. Area 4 is situated in a mixed industrial, commercial, and residential area. Area 4 is comprised of a building, an associated parking lot (formerly housing a machine shop), and a residential trailer park. The area has moderately rolling topography, and the physical features are typical of residential and industrial areas (i.e., power lines along many street right-of-ways, street lighting, etc). Soil will be excavated at the prescribed location adjacent to the building and treated by low temperature thermal desorption. Soil samples of the treated soil will be collected for analysis, prior to the return of the LTTD-treated soil to the excavation. Groundwater samples will be collected from existing monitoring wells and new monitoring wells that will be installed in the vicinity of the soil excavation.

SURROUNDING POPULATION: (x) Residential (x) Industrial (x) Commercial ( ) Rural ( ) Urban OTHER:

THIS PAGE RESERVED FOR SITE MAP

(Show exclusion zone, contamination reduction zone, and support zones. Indicate evacuation and reassembly points).

See following pages for Site Maps - Exclusion zones, Contaminant Reduction Zones, and Support Zones described on Page 3- Work Zone"

HISTORY: *Summarize below. Include complaints from public, previous agency actions, known exposures or injuries, etc.*

Groundwater contamination by Volatile Organic Compounds (VOCs) was originally discovered by the City of Rockford in 1981. Subsequent investigations performed between 1981 and 1997 revealed dissolved and non-aqueous phase VOC contamination in groundwater, as well as VOC contamination in soil and soil gas. The VOCs of concern are primarily chlorinated solvents (primarily 1,1,1-Trichloroethane), although benzene, toluene, ethylbenzene, and xylene (BTEX) is also a potential concern.

This remedial action includes the excavation of contaminated soil and the sampling of groundwater for VOC analysis, to obtain data for remedial design of Area 4 of the Southeast Rockford Superfund Site.

WASTE TYPES: ( ) Liquid (x) Solid ( ) Sludge ( ) Gas ( ) Unknown (x) Other, specify: None confirmed (if so, would be liquid)

WASTE CHARACTERISTICS: *Check as many as applicable.*

( ) Corrosive	(x) Flammable	( ) Radioactive
( ) Toxic	(x) Volatile	( ) Reactive (Fire)
( ) Inert Gas	( ) Unknown	( ) Other, specify:

WORK ZONES : *Describe the Exclusion, Contamination Reduction, and Support Zones in terms on-site personnel will recognize.*

Exclusion Zone - 10 feet around sampling point.
Contamination Reduction Zone - 20 feet around sampling point.
Support Zone - 30 feet around sampling point.

HAZARDS OF CONCERN:

(x) Heat Stress *attach guidelines*	(x) Noise
(x) Cold Stress *attach guidelines*	( ) Inorganic Chemicals
(x) Explosive/Flammable	( ) Organic Chemicals
( ) Oxygen Deficient	(x) Motorized Traffic
( ) Radiological	( ) Heavy Machinery
( ) Biological	(x) Slips, Trips, & Falls
( ) Other - specify	

FACILITY'S DISPOSAL METHODS AND PRACTICES: *Summarize below.*

Various locations: Disposal methods and practices appear to be typical of a residential/light industrial area. Area 4 is serviced by a city sewer system.

HAZARDOUS MATERIAL SUMMARY:

CHEMICALS: *Amount/Units:*	**SOLIDS:** *Amount/Units:*	**SLUDGES:** *Amount/Units:*	**SOLVENTS:** *Amount/Units:*	**OILS:** *Amount/Units:*	**OTHER:** *Amount/Units:*
Acids	Flyash	Paints	Halogenated (chloro, bromo) Solvents	Oily Wastes	Laboratory
Pickling Liquors	Milling/Mine Tailings	Pigments		Gasoline	Pharmaceutical
Caustics	Asbestos	Metals Sludges	Hydrocarbons	Diesel Oil	Hospital
Pesticides	Ferrous Smelter	POTW Sludge	Alcohols	Lubricants	Radiological
Dyes/Inks	Non-Ferrous Smelter	Aluminum	Ketones	PCBs	Municipal
Cyanides	Metals	Distillation Bottoms	Esters	Polynuclear Aromatics	Construction
Phenols	Other *specify:*	Other *specify:*	Ethers	Other *specify:*	Munitions
Halogens			Other *specify:*		Other *specify:* Agricultural
PCBs					
Metals (heavy)					
Dioxins					

JUSTIFICATION: ( ) High ( ) Medium (x) Low ( ) Unknown (Where tasks have different hazards, evaluate each.)
Previous site investigations

FIRE/EXPLOSION POTENTIAL: ( ) High ( ) Medium (x) Low ( ) Unknown

BACKGROUND REVIEW: (x) Complete ( ) Incomplete

Known or Suspected Contaminants	Highest Observed Concentration *(mg/kg)*	PEL/TLV *ppm or mg/m3 (specify)*	IDLH *ppm or mg/m3 (specify)*	Warning Concentration *(in ppm)*	Symptoms or Effects of Acute Exposure	Photo-Ionization Potential
1,1,1-Trichloroethane	360 mg/kg (S)	350 ppm	700 ppm	400 ppm	Headache, CNS depression, loss of balance, eye irritation	11.00
Tetrachloroethylene	260 mg/kg (S)	25 ppm	150 ppm	47 ppm	Irritated eyes, nose, throat, flushed face & neck, dizziness	9.32
Trichloroethylene	130 mg/kg (S)	50 ppm	1,000 ppm	82 ppm	Vertigo, visual disturbance, headache, drowsiness	9.45
Vinyl chloride	0.005 mg/L (GW)	1 ppm	Carc.	NA	Weakness, stomach pain, cancer	10.00
1,1-Dichloroethene	0.24 mg/kg(S)	100 ppm	3,000 ppm	120 ppm	Skin irritation, drowsiness	11.10
1,1 Dichloroethylene	0.69 mg/L (GW)	1 ppm	>500 ppm	1.1 ppm	No acute effects	<11.0
1,2 Dichloroethylene	49 mg/kg (S)	200 ppm	1,000 ppm	1.1 ppm	Irritated eyes, CNS depression	10.00
Benzene	0.032 mg/L (GW)	0.5 ppm	500 ppm	61 ppm	Eye & nose irritation, headache, giddiness, nausea, fatigue	9.25
Ethyl benzene	31 mg/kg (S)	100 ppm	800 ppm	200 ppm	Eye & nose irritation, headache, narcosis	8.76
Toluene (skin)	23 mg/kg (S)	50 ppm	500 ppm	1.7 ppm	Fatigue, confusion, euphoria, dizziness, headache, tears	8.82
Xylene	210 mg/kg (S)	100 ppm	900 ppm	5 ppm	Eye, nose & throat irritation, drowsiness, nausea, incoordination	8.44
Chloroform	.028 mg/l (GW)	2 ppm	500 ppm	192 ppm	Mental dullness, headaches, ane	11.40

NA = Not Available **U = Unknown**

NE = None Established

S = Soil | SW = Surface Water | LE = Leachate | T = Tailings | D = Drums | SG = Soil Gas | W = Waste
A = Air | GW = Ground Water | SL = Sludge | SD = Sediment | TK = Tanks | OFF = Off-Site | L = Lagoons

HEALTH AND SAFETY PLAN FORM CDM Health and Safety Program	*This document is for the exclusive use of CDM and its subcontractors*	CAMP DRESSER & McKEE INC. PROJECT DOCUMENT #:	
TASK DESCRIPTION/SPECIFIC TECHNIQUE/SITE LOCATION *(attach additional sheets as necessary)*	**Type**	**Primary**	**Contingency**	HAZARD & SCHEDULE
1 Soil Excavation for remedial action	Intrusive	D	Exit Area	Low 2004
2 Monitoring Well Installation	Intrusive	D	Exit Area	Medium 2004
3 Groundwater sampling (via a submersible pump and/or bailers)	Intrusive	D	Exit Area	Low 2004
4 Soil sampling of LTTD-treated soil	Non-intrusive	D	Exit Area	Low 2004
5 Effluent Water Sampling	Non-intrusive	D	Exit Area	Hi Med Low 2004
6	Intrusive Non-intrusive	A B C D Modified	A B C D Exit Area	Hi Med Low

PERSONNEL AND RESPONSIBILITIES *(include subcontractors)*

NAME	Division/Office	CDM HEALTH CLEARANCE	RESPONSIBILITIES	Tasks on Site?
John Grabs	Central/Chicago		Work Assignment Manager	1,2,3,4,5
Naren Prasad	Central/Chicago		Site Health & Safety, Field Coordinator	1,2,3,4,5
Nick Simons	Central/Chicago		Field Personnel	1,2,3,4,5
Shawn Shiffer	Central/Chicago		Field Personnel	1,2,3,4,5
Lisa Harrison	Central/Chicago		Field Personnel	1,2,3,4,5

HEALTH AND SAFETY PLAN FORM	*This document is for the exclusive*	CAMP DRESSER & McKEE INC.
CDM Health and Safety Program	*use of CDM and its subcontractors*	PROJECT DOCUMENT #:

PROTECTIVE EQUIPMENT: *Specify by task. Indicate type and/or material, as necessary. Group tasks if possible. Use copies of this sheet if needed.*

TASKS: 1,3,4,5
LEVEL: D
(x) Primary ( ) Contingency

Respiratory: (x) Not needed
( ) SCBA. Airline:
( ) APR:
( ) Cartridge:
( ) Escape Mask:
( ) Other:

Head and Eye: ( ) Not needed
(x) Safety Glasses:
( ) *Face Shield:*
( ) Goggles:
(x) Hard Hat: if overhead hazards
( ) Other:

Boots: ( ) Not needed
(x) Steel-Toe ( ) Steel Shank
( ) Rubber (x) Leather
( ) Overboots

Prot. Clothing: (x) Not needed
( ) Encapsulated Suit:
( ) Splash Suit
( ) Apron:
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Cloth Coverall:
(x) Other: Work Clothes

Gloves: ( ) *Not needed*
( ) Undergloves:
(x) Gloves:
( ) Overgloves:

Other: specify below
(x) Sun screen
( ) Hearing protection
( ) Bug repellant
( ) Flotation Device

TASKS: 2
LEVEL: D
(x) Primary ( ) Contingency

Respiratory: (x) Not needed
( ) SCBA, Airline:
( ) APR:
( ) Cartridge:
( ) Escape Mask:
( ) Other:

Head and Eye: ( ) Not needed
(x) Safety Glasses:
( ) *Face Shield:*
( ) Goggles:
(x) Hard Hat:
( ) Other:

Boots: ( ) Not needed
(x) Steel-Toe ( ) Steel Shank
( ) Rubber ( ) Leather
( ) Overboots:

Prot. Clothing: (x) Not needed
( ) Encapsulated Suit:
( ) Splash Suit
( ) Apron:
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Cloth Coverall:
(x) Other: Work Clothes

Gloves: ( ) *Not needed*
( ) Undergloves:
(x) Gloves:
( ) Overgloves:

( ) Other: specify below
( ) Flotation Device
(x) Hearing protection
( ) Bug repellant
(x) Sun screen

TASKS: 1,2,3,4,5
LEVEL: D
( ) Primary (x) Contingency

Exit Area

Respiratory: (x) Not needed
( ) SCBA, Airline:
( ) APR:
( ) Cartridge:
( ) Escape Mask:
( ) Other:

Head and Eye: (x) Not needed
( ) Safety Glasses:
( ) Face Shield:
( ) Goggles:
( ) Hard Hat:
( ) Other:

Boots: (x) Not needed
( ) Steel-Toe ( ) Steel Shank
( ) Rubber ( ) Leather
( ) Overboots:

Prot. Clothing: ( ) Not needed
( ) Encapsulated Suit:
( ) Splash Suit
( ) Apron:
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Cloth Coverall:
( ) Other:

Gloves: ( ) Not needed
( ) Undergloves:
(x) Gloves:
( ) Overgloves:

( ) Other: specify below
( ) Flotation Device
( ) Hearing protection
( ) Bug repellant
(x) Sun screen

This health and safety plan form constitutes hazard analysis per 29 CFR 1910.132

HEALTH AND SAFETY PLAN FORM CDM Health and Safety Program	*This document is for the exclusive use of CDM and its subcontractors*	CAMP DRESSER & McKEE INC. PROJECT DOCUMENT #:
DECONTAMINATION PROCEDURES		
ATTACH SITE MAP INDICATING EXCLUSION, DECONTAMINATION, AND SUPPORT ZONES AS PAGE TWO		
Personnel Decontamination *Summarize below or attach diagram;* Team members will remove their protective clothing in the following order (as applicable): Equipment Drop Glove Removal Hand and Face wash ( ) Not Needed	**Sampling Equipment Decontamination** *Summarize below or attach diagram;* Bag all disposable sampling and PPE equipment. Wash/rinse the outside of sample containers in soapy/clean water. Wash all non-disposable sampling equipment in Alconox solution or equivalent with designated brush. Follow with tap water and distilled water rinse. ( ) Not Needed	**Heavy Equipment Decontamination** *Summarize below or attach diagram;* (x) Not Needed
Containment and Disposal Method Disposal as general refuse.	**Containment and Disposal Method** Decon water containerized in 55-gallon drums. IDW disposal as general refuse.	**Containment and Disposal Method**

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EMERGENCY CONTACTS

Water Supply	
Site Telephone	NA
EPA Release Report #:	1-800-424-8802
CDM 24-Hour Emergency #:	1-732 / 539 - 8128
Facility Management	
Other (specify):	
JULIE (Utility Locator) Phone number =	1-800-892-0123
CHEMTREC Emergency #:	1-800-424-9300

CONTINGENCY PLANS: *Summarize below*

The CDM Site Health & Safety Coordinator (SHSC) will designate contamination reduction (decon) zone, support zone, and evacuation routes prior to each task. CDM staff may chose to wear more protection than that directed by this plan.

Without regard to instruments, CDM personnel will leave the area and may then consider upgrade of their level of protection if they experience dizziness, nausea, or any other irritative symptoms caused by their environment.

In the event of an accident during soil excavation activities, all work shall halt immediately. Personnel shall promptly leave the area if a condition of immediate danger to health and safety exists. Safety issues will be examined prior to the resumption of work activities.

A copy of the Health & Safety Plan will be kept on site at all times. The Health & Safety Plan must be reviewed and signed by all CDM personnel onsite. CDM will have daily health & safety meetings, as needed, to disuss that day's work events and safety issures.

HEALTH AND SAFETY PLAN APPROVALS

Prepared by	Mark Peters/Michael Ehnot	Date	5/15/2003 (amended 6/9/04)
DHSC Signature		Date	
HSM Signature	Todd Burgesser (e. sign)	Date	6/2/2003

EMERGENCY CONTACTS	NAME	PHONE
Health and Safety Manager	Chris Marlowe	908-225-7000
Project Manager	John Grabs	312-346-5000
Site Safety Coordinator	Naren Prasad	312-346-5000
Client Contact:	Tom Williams	(815) 223-1714
Client Contact:		
Environmental Agency:		217-782-3397
State Spill Number		800-782-7860
Fire Department		911
State and Local Police Department		911
County Health Dept		
Poison Control Center	National	1-800-382-9097
Occupational Physician	Jerry Berke	1-781-935-8581

MEDICAL EMERGENCY **		PHONE
Hospital Name:	Swedish American Hospital	(815) 968-4400
Hospital Address	1309 2nd Avenue, Rockford, IL	
Name of Contact at Hospital:		
24-Hour Ambulance:		911
Route to Hospital:		

Routes from Area 4 are shown on the following pages. Site personnel should determine which area they are working in, before initiating site activities.

Distance to Hospital 2.5 mi. (Area 4)/5 mi. (Area 7)

Attach map with route to hospital

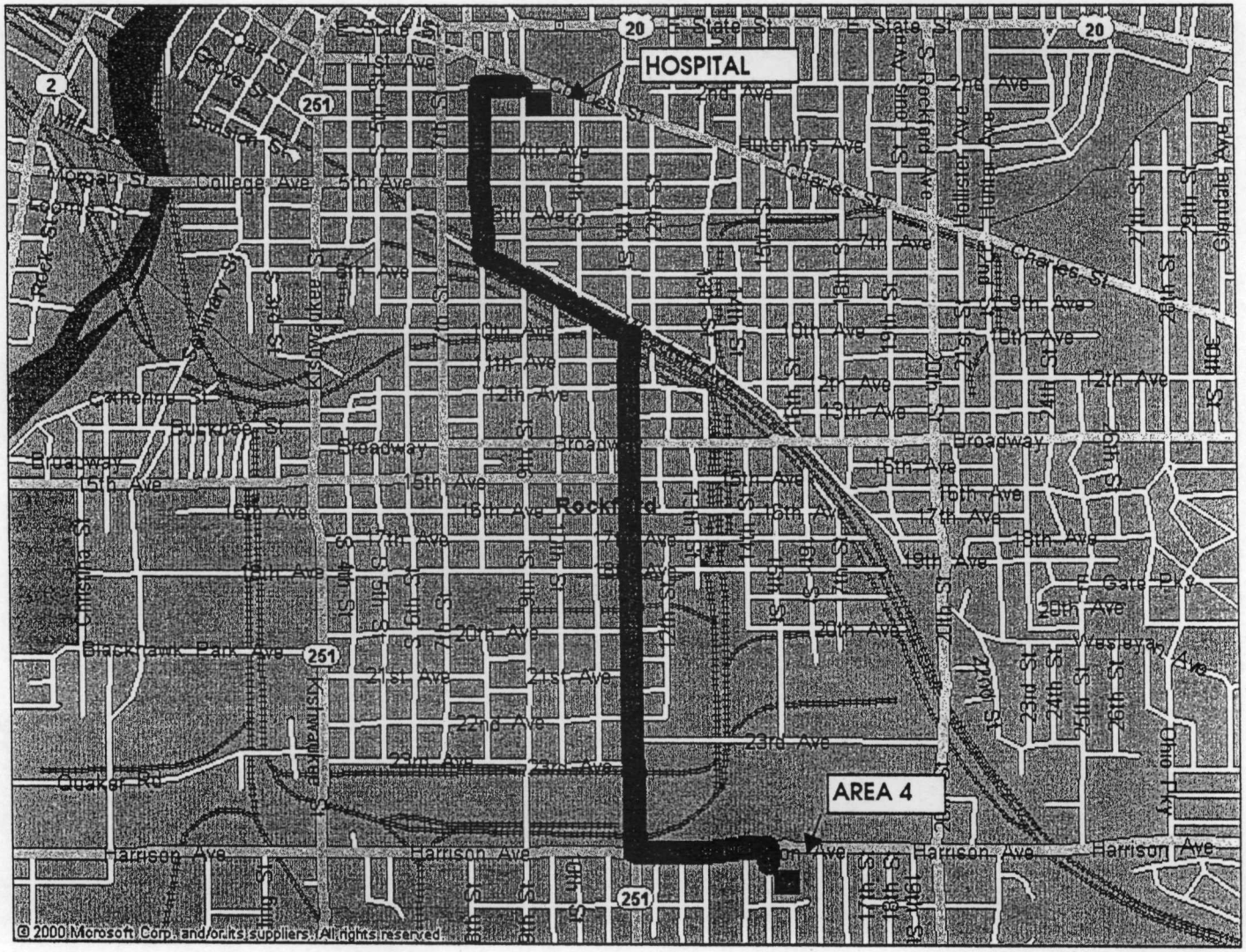
MAP TO HOSPITAL FROM AREA 4

From Swebco Bldg
Parking Lot…
North on Marshall St.
Left (W) onto Harrison
Right (N) onto 11th St.

Left (NW) on Railroad Ave

Right (N) onto 8th St.

Right (E) onto 2nd Ave
Arrive at Hospital
Swedish American Hospital
1309 2nd Avenue



HEALTH AND SAFETY PLAN SIGNATURE FORM

CDM Health and Safety Program

INSTRUCTIONS: All field personnel must sign this form indicating their receipt of this health and safety plan. Keep this original on site. It becomes part of the permanent project files. Send a copy to the health and safety manager.

SITE NAME / NUMBER: Southeast Rockford Superfund Site- Remedial Design Field Studies

DIVISION / LOCATION: South of Harrison Avenue and East of 11th Street, Rockford, IL

I understand, and agree to comply with, the provisions of the above-referenced HSP for work activities on this project. I agree to report any injuries to the site health and safety coordinator (SHSC). I agree to inform the SHSC about any drugs (legal or illegal) that I take within three days of site work.

PRINTED NAME	SIGNATURE	DATE